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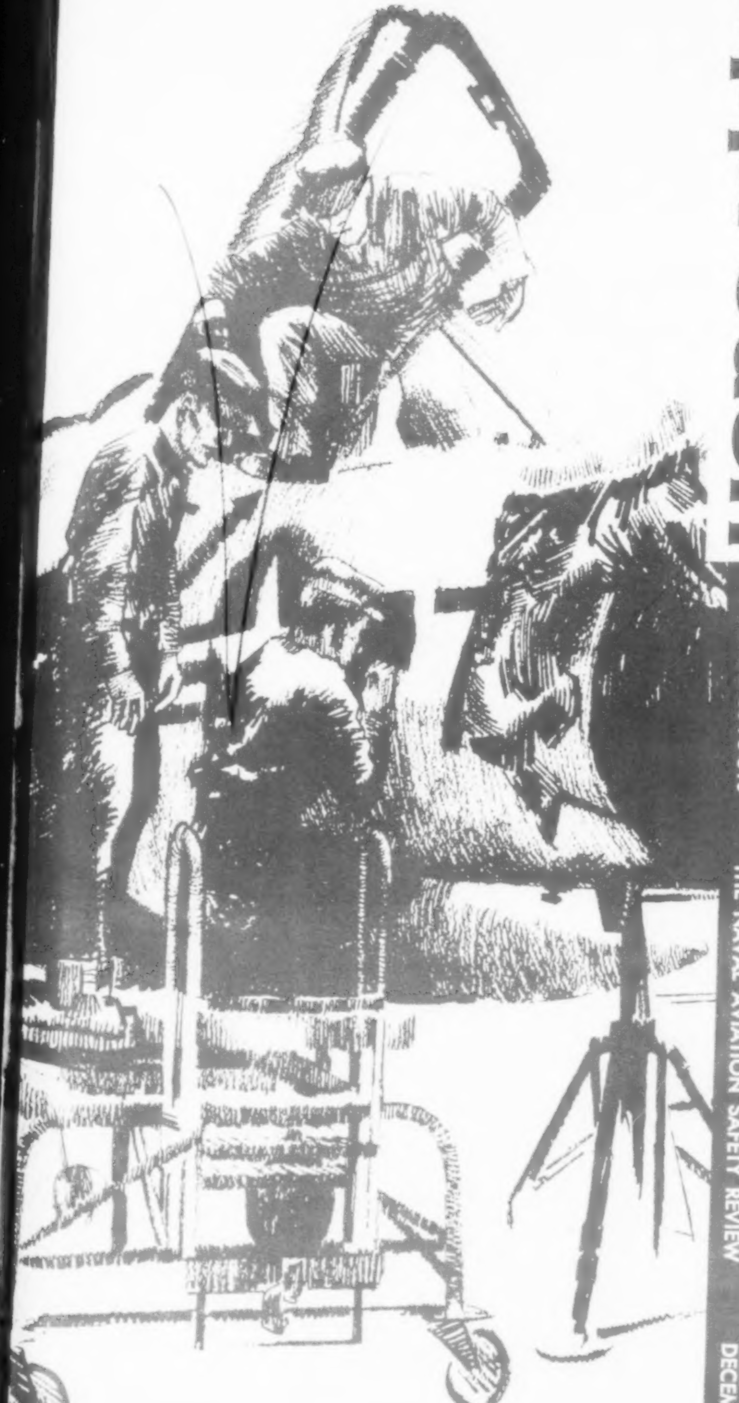

Our Product is safety, our process is education, and our profit is measured in the preservation of lives and equipment.

approach

DECEMBER 1961 ○ VOLUME 7 ○ NUMBER 6

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APPROACH, The Naval Aviation Safety Review

Published by the Naval Aviation Safety Center

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The Life You Save May Be Someone Else's

by CDR D. M. Hume

Isn't there something that bothers you about the motto of the National Safety Council?

For years they have been telling us, "The Life You Save May Be Your Own." This seem to presume the existence of a universal selfish attitude. If it is necessary to appeal to the instinct for self-preservation in order to sell safety, then perhaps we are just animals after all. Would it not be a more constructive and positive approach to appeal to the social instinct, consideration and respect for others?

The pilot who has ridden his plane into an open field rather than let it fall into a populated area has demonstrated that "self-preservation" is not always the prevailing drive.

Surely, the same concern for the other man would make the pilot's lookout doctrine a more potent safeguard against mid-air collision. How far more orderly and safe our traffic patterns would be if every pilot were constantly attendant to the problems of others and not just his own. It is not coincidental that the continued safe operation of civilian airlines is directly tied to their paramount goal, the well-being and comfort of passengers.

In the manufacturing and maintenance areas our struggle is one against inertia and boredom. Here, the "self-preservation" idea is of no use to us at all. We must rely entirely upon the unselfishness of ground personnel. Unfailing attention to inspection and check procedures must be elevated above the menial task level.

What better way can this be done than by repeatedly impressing upon the mechanic the truth that the lives of crews and passengers are daily in his hands?

Indeed, the same could be said about every officer and man associated with an aviation unit. From the paymaster to the messcook, from the chaplain to the hospitalman, every one of them contributes to the environment of the organization. The uniformity and secureness of that environment are essential to the efficient and safe conduct of the flying mission. We must not allow even the least of these men to be lulled into the notion that his job is unimportant or of little consequence. His niche in the pattern must be described for him. His impact, however slight, upon the success of the mission must be made clear to him. This is one of the keys to improved morale. High morale and safety of flight are inseparable.

This is the positive approach. It is not unlike the United Air Lines philosophy that, "A Job Well Done Is Inherently Safe." This is the kind of thinking which will give vigor and direction to the aviation safety program. Shall we say 'perform' or 'avoid'? The former connotes action; the latter invites inaction.

So, let's get busy and change the posters. Let's make all hands keenly aware that, The Life They Save May Be Someone Else's. Only then will preservation of self and safety of flight most surely follow.

Purposes and Policies: APPROACH is published monthly by the U.S. Naval Aviation Safety Center and is distributed free to naval aeronautical organizations on the basis of 1 copy per 12 persons. It presents the most accurate information currently available on the subject of aviation accident prevention. Contents should not be construed as regulations, orders, or directives. Material extracted from Aircraft Accident Reports (OpNavs 3750-1 and 3750-10), Medical Officer's Reports (OpNav 3750-8) and Anymouse (anonymous) Reports may not be construed as incriminating under Art. 31, UCMJ. Photos: Official Navy or as credited. Non-naval activities are requested to contact NASC prior to reprinting APPROACH material.

Correspondence: Contributions are welcome as are comments and criticisms. Views expressed in guest-written articles are not necessarily those of NASC. Requests for distribution changes should be directed to NASC, NAS Norfolk 11, Va., Att: Safety Education Dep't., if you are receiving the magazine free because of military or commercial contact status with the Navy. . . . IF YOU ARE A PAID SUBSCRIBER, address all renewals and change of addresses to Superintendent of Documents, Washington 25, D. C.

Printing: Issuance of this publication approved by the Secretary of the Navy on 15 April 1961.

Subscriptions: Single copy 30 cents; 1-year subscription \$3.50; 2 yrs., \$7.00; 3 yrs., \$10.50; \$1.00 additional annually for foreign mailing. Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C.

Library of Congress Catalog No. 57-60020.

LETTERS TO THE EDITOR

"Legendary Pilot" Reaction

Otis AFB, Massachusetts—I have just finished reading your July issue of APPROACH and this letter has a two-fold purpose. First, we receive a copy of your magazine each month and I would like to express our opinion of its contents; terrific! Although many articles do not pertain to our type of flying, many of the safety articles we distribute to our aircrews. Secondly, the article by P. K. Roberts, "How To Become A Legendary Pilot," is one of the best articles concerning flying that I have ever read. If there is no personal or official objections, or copyright infringements, I intend to have the article reproduced (giving full credit to the source as well as the author) for distribution among my aircrew members.

We are one of three tactical squadrons in the Airborne Early Warning and Control Program here at Otis. I have some 50 odd pilots with 300 crewmembers flying the RC-121 (WV-2) around the clock. Some of the younger pilots have been with us approximately 4 years and have amassed over 4000 hours in the RC-121. We have some of the "older heads" in the 7000-10,000 hour category and I believe this article appropriate for all. Additionally, I think that our younger crewmembers will realize enjoyment and satisfaction from the story. . .

Again, a real fine magazine and one that we rely upon as well as our own Air Force Safety monthly. From the two, and suggestions therein, we have received many items that we have placed into effect. This has greatly assisted our squadron in amassing a safety record without accident or fatality in over 90,000 flying hours during the last six years.

MAX SANSING
Lt Col., USAF
Com. 962nd AEW&C Sqdn.

● Have forwarded your reprint request to original source, *Skyways*. Meanwhile, keep up the good work.

Report Your ATC Problems to FAA

The Federal Aviation Agency is sponsoring a post card questionnaire to determine problem areas in the air traffic control systems.

These self-addressed postage-free cards have been distributed to air carrier operations offices, military base operations offices, FAA flight service stations, and aircraft sales and service offices at municipal and private airports so as to be available to pilots in all phases of the aviation industry.

Pilots are requested to report a specific problem encountered in the ATC system. This could include such items as excessive delays, unusual procedures, complicated clearances, inadequate weather information or pilot briefing.

Only factual information regarding the complaint is asked for, the date, time (Z), location, and aircraft/trip number, followed by a short description of the incident. Then drop the card in any mail box.

The object of the program is to collect information which will lead to a better air traffic control system.

The success of the program depends on the validity of the incident and the sincerity of the pilot.

More on Quality Control

FPO San Francisco—The July issue of APPROACH carried a letter from a squadron that was concerned about their inability to satisfy the requirements of Quality Control. Though they don't know it, gentlemen, they have already conquered a major part of their task. In order to have Quality Control, you must want Quality Control. We approached this problem using the basic premise that if BuWeps required Quality Control, they must know that it was at least partially possible; and we were going to try.

Attack Squadron FIFTY-FIVE has consistently been under manning level in the very ratings necessary for maintenance and Quality Control. Prior to giving the requirements of BuWeps Instruction 5440.2 in regard to Quality Control a fair shake, it was necessary to prepare our troops for the shock. We gathered the Maintenance Department in a brainstorming type conference. We opened the meeting with the positive assertion that we would have Quality Control. In the beginning we had approximately 50% scoffers, 25% you've-got-to-show-me and 25% willing to try anything.

It should be obvious . . . that it is impossible for a small operational type unit to remove from their normal functions those personnel that should be involved in this type of work. The very nature of Quality Control demands the abilities generally in short supply and ill-spared if any maintenance is to be accomplished at all.

The first move made was to assign an officer this billet as a full time duty. To him was assigned a Chief, competent with maintenance hardware and unafraid of paperwork. A quota was secured for the Chief to attend the Quality Control School conducted at O & R, NAS Alameda. The tools used by these men are the Work Order and Work Accomplishment Record, Check Sheets and Pilot Aircraft Inspections.

Being a small organization, it was obvious who were the best qualified people in each of the shops to perform as inspectors. These men were designated in writing by the Maintenance Officer. A briefing and both oral and written examinations were administered in order to standardize their efforts. Basically their job was to inspect work accomplished by other men in their shop and to lay their reputation on the line by signing that portion of the Work Order and the Check Sheet that deals with the inspection of work accomplished. In all cases the Quality Control Officer maintains a file of the work orders and he or his assistant frequently conducts spot checks of work quality. Incidentally, the work orders and "Yellow Sheet Gripes" are maintained in a file by aircraft modex number. This information is further tabulated on a form for each aircraft and provides a firm basis for trend analysis.

Attack Squadron FIFTY-FIVE considers that the corrosion problem is best controlled by the Quality Control Division. By demanding that maintenance personnel are conversant with and properly utilize the information available in the Handbook for Preservation of Naval Aircraft, defects and unaccept-

able situations have been found and remedied. The scheduled weekly pilot inspection of aircraft operates as a positive control of general maintenance practices and the adequacy of the corrosion prevention program. Each pilot is carefully briefed on the types of discrepancies to watch for and utilizes an inspection form developed locally and administered through the Quality Control Division. A pilot always inspects the same aircraft and therefore is better prepared to notice recurring discrepancies. However, this is assured by the Quality Control Officer by notation on the individual inspection forms of the previous week's findings. The completed forms are maintained for two months in the trend analysis files and then discarded. It is amazing to find the added interest generated in the pilot inspector when he realizes that he is not just carrying out a perfunctory task but is actually a part of a continuing maintenance function designed to protect himself.

So far, we have had no difficulty in adapting Quality Control to shipboard duty. As a matter of interest, it appears that our program has become more dynamic and consequently more productive while at sea. We recognize that our system has its weak points and these holes we are endeavoring to close. On the other hand, we have the pleasure of knowing that we have at least tried to comply with a perhaps too ambitious directive.

For our mutual improvement, this squadron would welcome an exchange of notes with other activities.

WALTER L. CLARKE, JR., LCDR

● **Please see "Research in Maintenance" page 36.**

Standardization of LSO Phraseology

FPO San Francisco—It is a generally accepted fact that GCA controllers should use a standard voice procedure in order to avoid misunderstanding between the pilot and the GCA controller. CIC controllers utilize standard voice procedures for the same reason as do talkers on the ship's sound powered phone circuits. Pilots who work with the same LSO through a training cycle become familiar with his individual lingo, and his peculiar expressions and some degree of standardization results. Even this situation does not result in any real fixed procedure within an air group for as each squadron trains its new LSO and as he qualifies in the several types of aircraft, any one of some seven LSOs may control a recovery and each will use his own voice procedure. When the group reforms the problem of learning the lingo is of course repeated. Pilots must learn to react to:

"Give me a tad,"
"Hold it,"
"Keep her coming,"
"Hold what you got," and
"Hold her up."

Such expressions can mean different things to different people and as such introduce an additional hazard.

I do not imply that Heavy Eight has been the victim of such lingo, for the seven Landing Safety Officers of Air Group TWO display excellent radio discipline and it is a result of having experienced this fresh approach that I am suggesting that APPROACH take up the crusade.

It is suggested that a standard LSO voice procedure be promulgated and I know of no better way to push this than through APPROACH. It is suggested that LSO voice transmissions be limited to the following terms:

RIGHT for turn right
LEFT for turn left
FAST for slow down
SLOW for speed up
HIGH for decrease altitude and then resume glide angle
LOW for increase altitude then resume glide angle
POWER for decrease glide slope or rate of descent, add power
HOLD IT for maintain power and altitude for the deck is pitching and you will be in good condition at the ramp
WAVE OFF for wave off

Such a standard voice procedure would allow any pilot to perfectly comprehend the directions of any LSO. Such is of particular importance under the level readiness concept where a young pilot is required to fly under the control of a number of LSOs within a short period.

J. T. COCKRILL
CO, VAH-8

● **APPROACH concurs that standardization of LSO phraseology is a good thing. The concept is not entirely new, however, ComNavAirLant Notice 3730 of 23 September 1959 concerned Emergency Carrier Approach Procedures. Enclosure (1) to that notice was entitled "Table of Standard Radio Phraseology for NavAirLant Landing Signal Officers" and is listed below for information.**

Communication	*Explanation*
You are on glide path	**Airplane is on glide path**
You are high/a little high	**Airplane is above/slightly above glide path**
You are low/a little low	**Airplane is below/slightly below glide path**
Check your line-up	**Airplane is not lined up with centerline**
You are fast/a little fast	**Self explanatory**
You are slow/a little slow	**Self explanatory**
Power	**Increase power immediately**
Wave Off	**A mandatory signal which will be answered immediately**
Cut	**A mandatory signal which will be answered immediately (For props a cut is taken and a landing is effected. For jets no cut is taken; however it is used as a release signal and is mandatory that a landing be effected)**
Foul Deck	**Informative signal**
Hook	**Check position of tailhook**
Wheels	**Lower wheels**

Your proposed transmissions are very similar, but it is believed that "check your lineup" will induce a better response by the pilot and be less confusing than telling him which way to turn.

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E FUTURE

WHAT is keeping up with which? Much conversation is made about pilots not keeping up with aircraft advancements. The machine gets faster and fancier and the pilot is largely occupied with the business of catching up and then keeping up.

But the pilot was not alone in the big drive for keeping up with technology. The runways seemed to be getting shorter, more midairs hit the headlines and ATC was chasing jets with equipment which was just fine for tracking props. The pilot's job would be much easier if only the facilities were as modern as the aircraft.

Improvements in equipment and techniques for the control of aircraft have been coming at a furious rate. It is an unusual day when some change does not appear in flight publications and procedures in an effort to get the controller out in front of the controllee.

There is one pilot pitfall in all this. It is no longer enough for the pilot to become intimately acquainted with his vehicle, he must also exert an extra effort to keep pace with a faster and fancier ATC.

Ground facilities exist only to assist the pilot. He must learn what those facilities are and how best to use them if he hopes to be helped instead of confused.

There are many facets to getting and keeping an aircraft in the air. Everyone connected with the business is continually striving to improve his particular area to make flying safer, faster, easier and more comfortable for both pilot and passenger. We in the military strive for a more efficient weapon as well.

Instrument flying today is safer than visual flying. The improved navigational facilities enable pilots to fly a more precise course, while under IFR conditions, air traffic control knows where all aircraft are at any one minute. During VFR operations every pilot must adhere to the 'see and be seen' policy. This is not easy. Limited visibility in most aircraft and current speeds have already pointed up the limited capacities of the human eye.

Various improvements in navigational aids are presently being tested at the Bureau of Research and Development Center at Atlantic City, N. J. Among these improvements is Doppler VOR which reduces azimuth errors caused by rough terrain sitting problems. The Doppler VOR is compatible with existing VOR equipment.

Five different systems designed to provide a visual guide slope to pilots "breaking out" on instrument approaches and to confine flight to a specific flight profile have been evaluated at the Center. The five systems extensively flight tested were the Calvert System; Navy Mirror System; Air Force "Meatball" System; Australian Cummings Lane System; and British Tri-Color System. The Calvert System is now the national standard.

Evaluation of automatic landing systems permitting a "hands-off" approach to the runway is also being continued.

ATC communications can look forward to a tremendous advancement with the implementation of an AGACS (pronounced ajax) system. This Automatic Ground-Air-Ground Communications Sys-

by LT Stanley Kingham

tems will be a time division two-way data link for the mutual exchange of information between the ground and air environments. One experimental system was produced by Radio Corporation of America, and consists of a ground installation and one aircraft test bed. It is a tool with which components and techniques can be evaluated toward a common automatic communications system for the control of air traffic.

The experimental model of AGACS has the capability to interrogate approximately 500 aircraft in 2 minutes. In an enroute configuration, channel changing by pilots will be minimized and a small number of channels will be employed. Functions are restricted to routine communications with a complete back up by voice when required.

The ultimate data link system that will evolve from experimentation with AGACS and other systems will be a key input to a semiautomatic ATC ground system to serve all users of airspace.

Installation has already begun on various new types of radar including a bright display radar. This will enable the controller to work in a well lighted area instead of under a tent or in the well known darkroom.

With the ever increasing size and speed of modern aircraft, perhaps the greatest aid being developed and procured for the air traffic controller is the semiautomatic data processing system. Computers are installed in six of the ARTC centers at present.

Here's how the system works. A flight plan filed with an ARTC Center is entered into the computer where it is analyzed for a logical route of flight. If this condition is met three flight progress strips are printed out for the departure controller. After the aircraft is cleared the departure time is entered into the computer and the remainder of the flight progress strips along his route of flight (which were stored in the computer) are now printed out and delivered to the appropriate controllers.

These strips are neat, legible and contain accurate estimates over the various fixes. One half hour prior to the estimated entry time into an adjoining center's area the estimate is automatically transferred to the adjoining center's computer, processed and printed out. This is known as an on-line operation and is presently in existence with the six computer equipped centers in the northeastern section of the country.

The computers relieve the controllers and assistant controllers of a great deal of the clerical work involved in preparing flight progress strips allowing them to use their skill and knowledge to better advantage—that is, concentrating on, planning and actually controlling traffic.

The computer, through programming, is capable of processing several types of flights. These are airways, direct point to point, distance and direction, rho-theta, latitude and longitude and any combination of the above.

By 1962 the controller will have an input keyboard and visual display which will enable him to update information on any flight stored in the computer and request certain information such as complete read out of flight plan, current altitude or estimate over a particular fix directly from his control position. The display will present the answers and also furnish him with updated data from another control position. Stored information can now be updated by the flight data entry position which is not as easy, fast or as practical as the new system will be. These keyboards and displays are known as Computer Updating Equipment or CUE's.

There are many other functions which computers can perform to assist the controllers. These include flow control analysis and perhaps the most important—potential conflict prediction and solution. These cannot be accomplished with the present medium speed computers but should be feasible with the DPC or Data Processing Central. Two new Librascope Air Traffic Control Computers will be operational in the Boston Center when it opens in October 1962. DPC will be the first computer specifically designed for air traffic control purposes.

The ever increasing speed of modern aircraft coupled with semi-automatic data processing will make it necessary and feasible to clear an aircraft to land in New York while passing over Chicago in a coast to coast flight. They will allow the controllers to set up a landing sequence well in advance with reasonable assurance that the aircraft will arrive on time. Landing delays will be cut to a minimum when radar, improved all weather landing systems and automation are combined.

Radar and radar tracking are available today so if assistance is needed don't wait until time becomes critical. "When in doubt give a shout to the nearest radar facility."

LT Kingham has been an Air Traffic Controller for the CAA (FAA) since 1947. His experience as a Naval Aviator includes tours with VS-35 and as Senior Naval Aviator aboard the USS CANBERRA.

At the present time, LT Kingham's FAA assignment involves the responsibility for accomplishing the programming for all computers used in Air Route Traffic Control Centers. This responsibility continues until each computer installation becomes fully operational at which time the job becomes one of continual monitoring and improving of the computer systems.

how to duck the high cost
of instruments

FOR THE BIRDS

THE TAKEOFF *NAS Whidbey Island*

ALTHOUGH usually modest, I am forced to admit I am considered an expert on certain phases of instrument flying. Only recently I have done considerable research on the Cat and Duck method of blind flying, and wish to say it is highly overrated.

You are probably familiar with the Cat and Duck dodge, where a cat is placed on the cabin floor. Because a cat always remains upright, he or she can be used to determine whether a wing is low. The duck is used for the instrument landing. Because a duck will not fly in instrument conditions, throw her out and follow her to the ground.

After several experimental flights, however, I find this system has some serious pitfalls, and the pilot using cats and ducks for the first time should observe several important rules:

1. *Get a wide-awake cat.* Most cats do not want to stand up at all, and very few stand straight at any time. A large dog should be carried to keep the cat at attention.

2. *Make sure your cat is clean.* Dirty cats will spend all their time washing. Trying to follow a washing cat usually results in a tight snap-roll followed by an inverted spin. You can see this is very unsanitary.

3. *Old cats are best.* Young cats have nine lives, but an old used-up cat with only one life left has just as much to lose as you do, and will be more dependable.

4. *Beware of cowardly ducks.* If the duck discovers you are using the cat to stand upright, she will refuse to leave without the cat. Ducks are no better on instruments than you are.

5. *Be sure the duck has good eyesight.* Nearsighted ducks sometimes fail to realize they are on the gages and will go flogging off into the nearest hill. Very nearsighted ducks will not realize they have been thrown out and descend straight down in a sitting position. This is hard to follow with an airplane.

6. *Use land-loving ducks.* It is very discouraging to break out of an overcast and find yourself on final for a rice paddy. Particularly if there are duck hunters about. Duck hunters suffer from temporary insanity when they are sitting in freezing water in their blinds and will shoot at anything that flies.

7. *Choose your duck carefully.* Many water birds look very much alike, and if you are not careful, you may get confused between ducks and geese. Geese are very competent instrument fliers, but are seldom interested in going the way you want to go. If your duck heads off for Canada or Mexico, then you know you have been given a goose.

F LLEN
NGEL
A

The cockpit of an inverted airplane changes from a familiar place to a strange labyrinth to the unprepared

AN HO4S was auto-rotated onto the water after the engine failed. The helicopter sank. The pilot received minor injuries. The other two occupants were not injured.

The HO4S was scheduled for a photo flight. The standard SAR fuel load was too heavy so defueling was done by disconnecting the flex line to the carburetor, leading it into a 55-gallon drum, and using the fuel boost pump. After 50 gallons had been pumped into the drum, the flex line was again connected to the carburetor and the fuel system tested by turning on the fuel boost pump with the mixture in IDLE CUT-OFF. The fuel system held pressure and there were no visible leaks.

The flight departed with four persons aboard. One of these transferred from the helicopter to a boat during the operation. Upon completion of the photographic work the pilot turned toward the base and started a climb from 200′. As the turn was completed the engine backfired.

The pilot lowered collective pitch and increased throttle. The engine gained RPM and appeared to operate normally. He then added collective. The engine started to backfire and lose RPMs. The pilot auto-rotated straight ahead (downwind) because of the low altitude. Contact with the water was made in a nose-up attitude with an estimated ground speed of 15 to 20 knots due to the wind. The helicopter rolled, apparently to the right, and then sank.

During the flight the pilot's sliding window was partially open but was not locked open. It slammed shut upon impact. The pilot was unable to see due to darkness which he thought was caused by the water. He later found that the grey plastic visor of his helmet had slammed down over his eyes. He attempted to open the sliding window with no success. He released his safety belt and immediately lost his orientation in the cockpit. He was not able to locate the sliding window jettison handle nor could he locate any other exit until he finally felt some broken plexiglas. He enlarged the hole in the plexiglas and exited through what he believes was the right sliding window.

In the cabin the crewmember and photographer were also having difficulties. The cabin door had been open for photography so the cabin flooded immediately. The crewmember got the photographer to the forward left emergency hatch and started him through this exit. He then attempted to get himself out of the aft left emergency hatch but found this very difficult because of the 'Tugbird' structural brace which partially blocks that exit. He was not sure that he could locate any of the other exits by this time or that they would be free so he felt that he should remain with the exit he had. He surfaced twice in a pocket of air trapped within the helicopter before he was able to work his way out of the exit. All of the occupants were picked up immediately by a Coast Guard 95′ patrol boat.

Despite efforts by Navy divers and dragging by Coast Guard vessels it was not possible to locate or recover the wreckage. The board reviewed the procedures used in removing and replacing the flex line during the defueling operation. All of the procedures were in accordance with accepted maintenance practice. There were no indications of previous discrepancies or other entries in the maintenance record or engine log book which would indicate any cause for engine failure. The board concluded that the engine failed due to an undetermined cause(s).

These were three lucky people. The photographer had someone to help him so his chances were good from the start. Both the pilot and the crewmember almost didn't make it. The story of what happened to them is a story that can be found in survivor's statements of almost any ditching where the plane sank immediately. Here is the way it usually happens:

The plane comes to rest. As soon as it stops,

you unfasten your seat belt. You want to get out, and right now. You know the plane, you have been flying it for years, you are going to head for the nearest exit.

But what happens when you unfasten that belt? While all violent motion has stopped, the plane is still moving—around all three axes—as it sinks. When you unfasten the belt you start to float away from the seat and you can now move around all three axes, but not necessarily in the same direction as the plane. It's dark (even without a helmet visor) and suddenly you are lost, lost in a relatively small cockpit, one that you know like the back of your hand. That window was just over to the right and slightly ahead, but which way is ahead and right? The plane might well be upside down in the water by now. At any rate, it is getting deeper by the second. You have *got* to get out of there.

Now starts a frantic groping in the dark. That familiar cockpit is no longer so familiar. If you are lucky, you grab something that you recognize and that helps to orient you. You move from the familiar object toward the exit that should be right over there. You can't travel as fast as you do in the air—your lungs are bursting—can that exit be this far away? Maybe that wasn't the old familiar object that you used to locate yourself, maybe you are going in the wrong direction?

Right about now panic strikes you. You are not making any progress and you have got to have some air. With those who did not survive, we can only guess at what happened next. Did they give up the struggle? Some will under these circumstances. Others will thresh madly about with no purpose or plan and use up what little air they have left. Some were undoubtedly trapped or caught in the wreckage and could not get out regardless of effort.

With those who did survive, a few did panic momentarily but managed to locate an exit and escape. The great majority realized that their only hope was in planned, persistent, methodical work toward escape.

This general run of events can be found in jet ditchings where the cockpit is so small you would not believe you could get lost. It can be found in helicopter ditchings, transport ditchings, practically any ditching where the plane sank very rapidly.

Is there a way to prevent this?

Yes—not by doing one thing but by a combination of several. Some of these are procedures you cannot practice. They are procedures that you will not be able to follow unless you prepare yourself now—and periodically refresh this preparation in your own mind.

First—you can realize that the problem of getting lost in a sinking plane is a real one. How do you prevent it? By making yourself sit in the seat with your belt fastened until you know where you want to go and how you are going and what you are going to do when you get there. That is a tough one—but if you have thought it out ahead of time and if you know and believe that this gives you the best chance, you can sit there a moment or two before releasing the belt. As long as that belt is fastened you know exactly where you are and can collect your thoughts and plan your move. Once you know exactly where to go, release that belt and go, man, go.

Second—you must know your plane. Sit right where you are as you read this and test yourself. Imagine that you are in the seat you normally occupy in the plane. Can you put your hand out and touch the emergency release handle for your exit? Do you know which way it turns, or whether it pushes or pulls? Do you know this for every exit, not only the ones in the cockpit but those in the cabin? If you don't, you need some review. What about the rest of your crew? If you need review, they probably do, too.

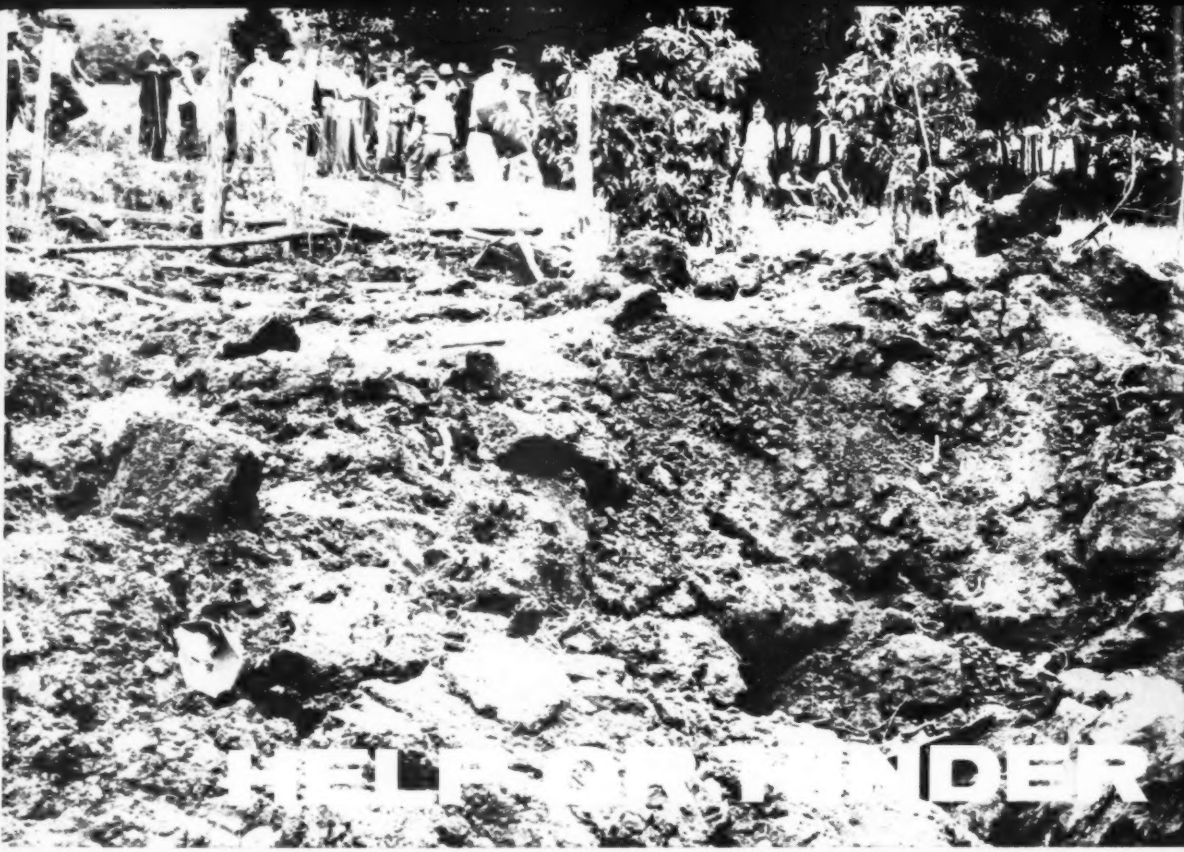
There are other lessons in this accident. The pilot's sliding window slammed shut because it was not latched open. It has a latch—use it. The pilot's sun visor slammed down over his eyes on impact. If you have a visor on your helmet, keep the visor mechanism in good condition and keep the visor latched at all times.

The Coast Guard commented upon the ease with which they sighted the crash helmets worn by the survivors. The helmets had been painted with fluorescent paint. How is the paint on your helmet? (BACSEB 1-60 now advises that fluorescent tape is preferable to paint. Ed.)

A few days after this accident the command found an emergency release handle on the copilot's sliding window in an HO4S which would *not* release the window. All units have been directed to make an immediate one-time inspection of these release handles. In the meantime an investigation is under way to determine whether the fault was in an improperly manufactured handle or in the rigging of the cable into the handle.

The location and operation of every piece of emergency equipment on your plane should be a basic part of your knowledge. It should never be allowed to become dim or rusty.

This is another area where lack of practice slips up on you before you realize it. You learn where all these items are during training—but how long has it been since you reviewed this knowledge? Thirty feet under water—dark—cold—scared—this is a mighty poor time to start a search for a handle or to try and read the arrow showing which way it turns.—
USCG Flight Safety Bulletin



HELP OR HINDER

You're out prospecting for uranium in the middle of the desert one day, when a flamed-out A4D executes a neat crash-landing nearby—close enough to scatter sand on your geiger counter . . . what do you do?

Your decision should be pretty obvious here—you'd trot over to help or rescue first, and worry about spreading the word only after you'd done what you could for the pilot.

Now, what about the opposite extreme? Let's say an aircraft comes to grief at an outlying field, right alongside the crash truck, and everyone around the 'phone shack charges off to help—do you charge off too, or do you run for the phone to pass the word back to the base? You might hesitate for a bit, but in such a case it might be more advisable to alert the base rescue and medical facilities to the possibility of their being needed—in a hurry.

But what about those "in-between" situations, where the decision isn't nearly so clear-cut? Here is where you have a sudden decision to make which might have a bearing on the survival of one or more persons. And it isn't an easy one. It can't be preplanned. But you can think about it a bit and have some ideas in mind for those suddenly arising occasions where you have a choice as to action.

Life is still our dearest commodity. It's almost instinctive on the part of most all of us to attempt rescue or aid of an injured party. If you're cool-headed enough to quickly evaluate a situation and see that rescue is virtually impossible, or that survival of occupants is hardly to be expected, you might decide to run or drive to pass the word first, and then return to lend a hand. But normally your first reaction is, "Gotta put out the fire . . . gotta git him out." Your decision and your action may not necessarily be the correct one, but whether you aid or go for aid, you're making a contribution—no one will blame you for failing to sit down and ponder over the situation in order to make the correct decision, not when immediate action counts.

Where you can make the right decision though, is in situations where you are a genuine spectator, where rescue has been made, where the fire is being put out, and you are one of a group of interested but not vitally needed observers. Whether you've done your part by rescuing or summoning aid, or whether

Official Spectator Card

The bearer of this card, having signed below, signifies that he is aware of his responsibilities as aircraft accident spectator, and that he is to be accorded no special privileges whatsoever.

Name	Rank/Rate

- Keep out of the way of investigators
- Do not pick up parts
- Do not disturb the position of any parts
- Do not step on parts
- Volunteer help or information, then carry out instructions
- Call investigator if you locate a part
- Retrieve parts from souvenir hunters, or inform security personnel
- Encourage other personnel to follow your example
- Better yet, if you're not needed, leave the scene.

you've just arrived at the scene, you have some well-defined obligations as a spectator.

Do what you can to keep other spectators from picking up or disturbing parts, if the security or investigating personnel aren't aware of them. Be especially watchful of children and non-military persons—not that they're more dishonorable, but they're not as closely associated with aviation as you are, and it's just natural for them to be more "souvenir-conscious" at an accident scene than men who work around aircraft every day. They aren't as aware of the accident-prevention importance of parts either, and may look upon a broken part as completely useless to anyone. Summon security personnel if your request is not heeded.

You see then, that even as a spectator you can make a positive contribution. And even if you do nothing but stand and look, you're contributing by NOT trying to be a "helpful spectator."

One of the biggest headaches to the investigators who take over on the scene after the occupants and fire/explosive hazards are removed, is the "helpful spectator"—the one who picks up a part, wipes it off neat and clean, discards the messy wires or tubing attached to it, and hands it to the investigator. "You mightn't have found this," he says, "cause it was under some big parts, but I moved them all out of the way into a neat pile." The temptation to throttle is often difficult for investigators to overcome.

If you must be a spectator, be a non-participating one! Don't pick up parts, don't move parts You might still be able to help, if an investigator asks, "has any one here seen a UHF control box . . . or the fuel pump?", but for gosh sakes don't come running up with the part like the winner of a scavenger hunt! You'll contribute far more if you locate the part and summon the investigator who will examine and note its location, its position relative to other items, and important clues like smoke marks, angle of impact, depth of imbedding.

By all means volunteer your help. The people directly concerned with investigating know that you're a spectator, they know that you can be helpful, and they'll call upon you if they need your help. Don't be bashful about volunteering help or information; you just might be the only person on the scene qualified to say whether or not an ejection seat appears to be safe—speak up, and if the people aren't profuse in their thanks, remember that they're doing a nasty, unpleasant job on short notice and under pressure—they just haven't the time to be as cordial or thankful as you might like them to be.

Even if you do and say nothing, you can hinder the efforts of an accident investigation just by walking around in an impact area. Small parts can be buried by a footstep, fragile parts can be broken, and the position of parts becomes less meaningful when there is evidence of many footprints among them. Keep your distance, walk carefully around parts if you must do so at all, and be alert for others who are not nearly as conscientious as yourself.

The Importance of

FAILURE to observe speed limits—on the high side (Vno and Vne) is an invitation to trouble in the form of structural problems.

An equally important speed limit which the pilot must keep in mind is one on the low side—minimum control speed (Vmc). The effect of ignoring this, under some circumstances, could be loss of control, resulting in a seriously hazardous maneuver.

The condition which is critical with respect to V mc is associated with loss of power on one side on a multi-engined airplane, particularly when high power is being applied to the remaining engines, such as during the takeoff, initial climb and waveoff.

When power is lost on one or more engines, the resulting asymmetric thrust must be counteracted (1) by rudder force; (2) by banking away from the inoperative engine(s); or (3) by reducing power on the operative powerplants. On takeoff or climbout, the third alternative may not be possible, since you may need all the power you can get to maintain flight. The amount of rudder force and/or lift available is, of course, proportional to

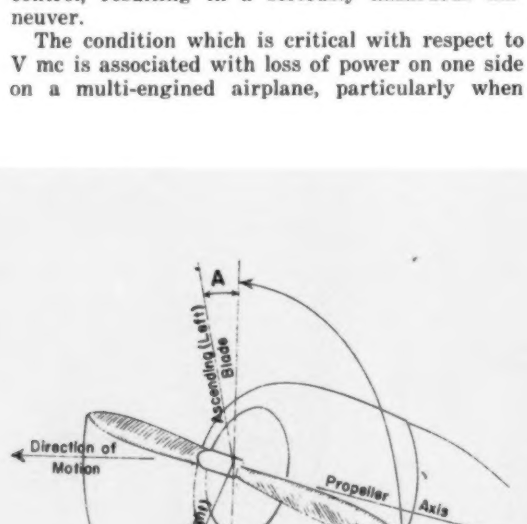


FIG. 1 Simplified illustration shows the effect of unsymmetrical propeller thrust (P factor) on a tailwheel type aircraft rolling in a 3 point attitude, or on any aircraft at a high angle of attack. Note that the angle of attack (A) of the left blade, which is much shallower than that (D) of the right blade, which causes additional thrust on the right side of the propeller disc.

P Factor

(and you have always called it TORQUE)

THE tendency of prop driven aircraft to turn to the left during the takeoff run is a factor which is often confusing to the pilot in maintaining directional control. This effect is commonly attributed to "torque," although the torque produced by the engine is one of less important causes.

The most significant factor is that the angles of attack of the rising (ascending) and the descending prop blades are quite different with respect to the relative wind. This is especially true in the short coupled aircraft rolling on the three-point position on the ground. This is called the "P" factor and is illustrated in Figure 1.

As noted under Figure 1, the effect increases as the angle between the direction of motion of the aircraft and the prop axis increases, whether the aircraft is on the ground or in the air. This angle may be produced by having an aircraft that sits tail low on the ground (as with tail wheel aircraft), or by flight with the wing at a high positive angle of attack (such as climb or slow flight).

VEE EM CEE

airspeed. The higher the speed, the more effective is a given amount of rudder or aileron deflection.

Minimum Control Speed is defined in the Civil Air Regulations as the minimum speed at which it is possible to recover control of the airplane, after the critical engine is suddenly made inoperative, and maintain it in straight and level flight—either with zero yaw or with an angle of bank not in excess of five degrees. The airplane manufacturer is required to demonstrate this during type certificate tests.

The configuration required for this demonstra-

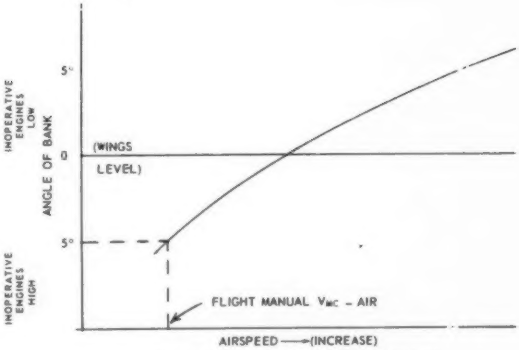


FIG. 1 – TYPICAL EFFECT OF BANK ANGLE ON V_{MC} – AIR

The same principle applies to both single and multi-engined aircraft as shown in Figure 2. The forward pull of D_1 (descending blade on no. 1 engine) is the same as D_2 (descending blade on no. 2 engine); however, the center of pull of D_1 is much closer to (centerline of airplane) than D_2, therefore, the turning moment of D_2 is greater than the turning moment of D_1.

The same principle and reasoning can be carried through on an aircraft with any number of engines and at any angle of attack.

The blades of a propeller are miniature airfoils and are therefore dependent on the angle of attack for their lift. In the aircraft with a positive angle of attack, the descending blade (blade on right side of aircraft) has a greater angle of attack than the ascending blade (blade on left side of aircraft). This extra pull, or thrust, by the blade which is on the right side of the aircraft tends to pull that side ahead of the left side and thereby causes the airplane to turn to the left. Conversely a negative angle of attack (dive) produces a greater thrust on the ascending blade, thereby causing the airplane to turn to the right.

—Multi-Engine Rating Study Guide
by MARVIN ELLSWORTH

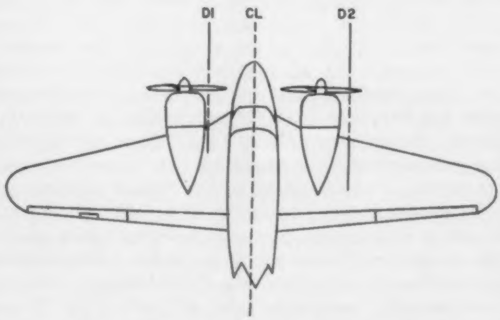


FIG. 2 The forward pull of D_1 (descending blade of #1 engine) is the same as D^2 (descending blade on #2 engine), however, the center of pull of D_1 is much closer to (the center line of the aircraft) than D_2, therefore, the turning moment of D^2 is much greater than the turning moment of D_1.

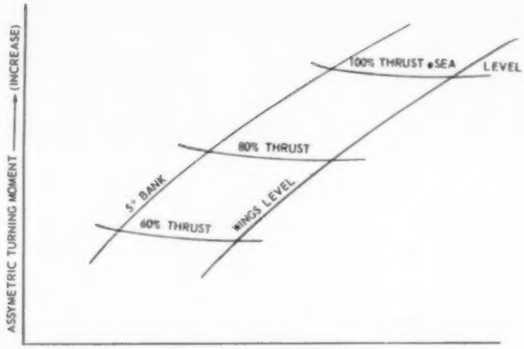


FIG. 2 - EFFECT OF ASSYMETRIC THRUST ON V_{mc} - AIR

tion is as follows:

1. Takeoff or maximum available power.
2. Rearmost (or "most unfavorable") center of gravity.
3. Flaps to takeoff position.
4. Landing gear retracted.
5. Cowl flaps (on piston-engined aircraft) in position normally used for takeoff.
6. Maximum sea level takeoff weight.
7. Airplane trimmed for takeoff.
8. Propeller windmilling on inoperative engine (or different position if specific design makes this more logical) and full power on other engines.
9. Airplane airborne and out of ground effect.

Additionally, the rudder control force required to maintain control must not exceed 180 lbs.

The minimum speed which will satisfy these conditions is quoted in the airplane flight manual as V mc-air. On all aircraft currently certified for transport operation, this speed is determined with the airplane in a five-degree bank with the operative engines on the low side, since this results in the lowest possible speed, and the capabilities of the airplane are utilized to the fullest advantage.

It is important to recognize that, with the wings in any position less than a five-degree bank angle, the minimum control speed is substantially higher than the value shown in the flight manual. On the most modern airplanes, the difference in V mc between the five-degree bank condition and wings level condition may be as high as 20 to 25 knots.

The reasons for this large increase in minimum control speed with varying bank angle are fairly complex. Essentially, the effect of the bank is to reduce the amount of rudder power required to overcome the asymmetric thrust condition. As the wings are brought to a level position, more rudder power is necessary. For a given rudder deflection or rudder pedal force, therefore, a higher speed is required.

This characteristic applies to all multi-engine airplanes. It is accentuated in the latest designs because of the large amount of power or thrust available for takeoff and the fact that the engines are disposed further out on the wing span. This increases the turning moment caused by the unbalanced thrust condition.

The point of all this discussion is that in order to achieve the best performance in case of an engine failure during takeoff, climb, or any other flight condition when high power is required, the airplane should be kept in a five-degree banked attitude with the inoperative powerplant on the high side. The normal takeoff procedure assures that airspeed will be above the minimum control speed (air) with the most critical engine inoperative. This is only true, however, if the five-degree bank angle is maintained.

Any variation from the configuration of flaps, gear, and power specified in the regulations, of course, will tend to make the situation less critical. The same principle, however, applies, namely that the control of the airplane is improved when the airplane is banked.

For specific information with respect to your particular airplane's handling characteristics and performance, refer (as always) to your airplane operating manual and the publications of the aircraft manufacturer.—*FSF Bulletin*

Confidential Report

Faced with those ambiguous terms used in confidential reports we have often wondered whether they meant exactly the same thing to all readers. The magazine of United Kingdom Atomic Energy Authority has now come to our rescue with the following glossary.

Assessment		Meaning
Hardworking	=	dirty flight suit.
Ambitious	=	likes money.
Overambitious	=	wants to be paid as much as me.
Bright	=	agrees with me.
Academic	=	once read a book.
Concrete ideas	=	all mixed up and set solid.
Good manager	=	gets others to do the work.
Good organizer	=	agent for carpets, washing machines and cigarets.
Forceful	=	shouts.
Observant	=	watches the girls.
Unobservant	=	near retiring age.
Good committee-man	=	sleeps upright.
Poor committee-man	=	sleeps horizontal.
Reflective	=	sleeps anywhere.

The FUTURE of NAVAL AVIATION

This year we have heard a lot about the history of naval aviation, tracing this phase of the Navy's activities from the decks of the 1911 USS PENNSYLVANIA to the commissioning of the 1961 USS KITTY HAWK. The tremendous accomplishments of naval air during this period naturally suggest the question "Where do we go from here?" The achievements of American and foreign missiles and spacecraft make us even wonder whether manned aircraft has a future.

Questions such as these are answered by Vice Admiral Robert B. Pirie's article, "The Future of Naval Aviation," in the first quarterly issue of "Sperryscope" for 1961. This periodical, published by the Sperry Rand Corporation, asked Admiral Pirie, Deputy Chief of Naval Operations (Air), to clear up the present and future status of naval air for its readers. A brief synopsis follows to encourage reading of the entire article.

Naval aviation has a responsibility for patrolling international waters to spot potential "highwaymen of the seas." In many cases, patrol planes are dual-purpose vehicles and once they have detected a submarine can change function to become an anti-submarine attack aircraft. Not only patrol planes, but entire anti-submarine carrier groups are available to fleet commanders to dispel the threat of underseas marauders. The need for such hunter-killer groups will increase with the improving character of submarines.

Close air support for amphibious troops is one of the functions of Marine Air Wings. They increase the firepower and range of modern amphibious task forces, as well as carrying men and materiel ashore.

The fast attack carrier task force is a "mobile, self-contained, self-sustained, versatile and nearly irresistible sphere of national sovereignty, influence, and if necessary, control." It is the Navy's front-line force in the cold war. Ideally suited to brushfire war, it has a secondary mission of nuclear deterrence.

One great advantage of the carrier task force is its mobility which makes its position hard to find and therefore hard to hit by ballistic missiles. This reliance on the sea as a base of operations removes many of the difficulties involved in maintaining foreign bases, and does not contribute in any way to the imbalance of international payments.

The nuclear bomb and the exploration of space do not make naval air power obsolete. "Nuclear weapons may increase explosions by 10 to the 12th power, and space exploration increase ranges as much, but these increases in destruction and distance, like earlier evolutions, do not displace the ultimate area of contentions, the inhabitable land areas of the earth. They simply add new dimensions to the age-old problem of control of people and real estate."

This nation's first seven Astronauts include four naval aviators (three Navy and one Marine Corps). Much of the training of these seven pioneers has been conducted by naval personnel at naval air installations.

Naval aviation has a vital role in today's world. There is no reason why the coming half-century of naval air will not be as great as the fifty years just ending. Indeed, there is reason to believe progress in the coming age may be greater.

CARRIER MONITOR

Survival Kit Delivery

The WFs are now carrying a 4-man life raft and survival kit which can be dropped to a downed pilot. The WF has an IFF detection capability, therefore, a pilot who is about to ditch and has a need for the survival kit should turn his IFF to emergency. This will allow the WF to locate the victim and drop the kit nearby.—*USS* SARATOGA

Blind Man's Buff

The Chief of Staff called the council's attention to ComNavAirLant Instruction 3710.28 of 28 December 1954, Safety Precautions for Landing Signal Officers. Recent violations of these safety precautions have occurred which resulted in aircraft mishaps. One violation was a hook spotter with uncorrected vision of 20/200 reporting "all down." Spotter was not wearing his glasses nor using binoculars. Aircraft made a no-hook landing and engaged the barrier. Another accident involved a no-hook landing and barrier engagement as a result of the hook spotter, without binoculars, acting also as the deck caller. The LSO should have a deck caller and a hook spotter assisting him. The training of these men is the responsibility of the LSO. Although responsible for ascertaining a clear deck prior to the cut, the LSO should not personally check the deck conditions. The hook spotter must be properly trained, physically qualified, and possess the necessary equipment to perform his duties—*ComFAirQuonset*

Chopper Escape Aid

HS-4 has rigged escape guide straps to the hatch in the HUS cabin. This is intended to prevent crew disorientation during night ditchings. The straps are fluorescent. Fluorescent cloth is also used on rescue slings to aid in night rescues. As a further aid, two small flashlights are fastened to the top of the sling for night rescues.—*Helicopter Committee—CVSG-51*

Twilight Zone

There are too many personnel forward by the island when aircraft are taxied forward after landing. If wheel brakes should fail, many injuries could occur. Squadron maintenance personnel will be screened to insure their presence in this position is absolutely necessary.—USS INDEPENDENCE

Good Edge, Good Point

It was recommended that a knife sharpener be purchased and placed in the readyroom for use of pilots and crewmen. The cost is expected to be between $2.00 and $4.00.—*VS-29*

Catapult End Speeds

The air officer stated that catapult end speeds were sometimes excessive of late, due in part to the pilots giving catapult officers extra weight indications. It was pointed out that excessive end speeds were just as dangerous as too low end speeds. Also, twice of late airplanes have crept forward when they were chocked. Pilots must still hold brakes and keep an eye out for movement even though they have been chocked. It has been noted that plane captains have been riding the aircraft with tools in their hands while the aircraft are being moved. This is not a safe procedure and is not to be tolerated. It is suggested that squadrons get bags for tie downs. Squadrons are urged to get personnel off the flight deck during recovery.—*USS* SARATOGA

Ready Deck and "Charlie" Time

DURING the operating period in question, several aircraft returned from STRIKEX missions unable to wait until the next recovery time on account of low fuel state. This required the ship to turn into the wind unnecessarily and confused the deck spotting problem. Also, pilots requested enroute letdowns and "Charlie" times from approach control. Approach control in turn gave the pilots scheduled recovery times vice "Charlie" times and when aircraft arrived overhead, a ready deck would not always be available and a short delay at low altitude would result.

It was concluded that: approach control would continue to give scheduled recovery times—; if the pilots required "Charlie" time for enroute letdown purposes, they would switch to Pri Fly frequency temporarily and get the "Charlie" time direct; if no "Charlie" was available, the pilot would proceed in bound at altitude until he was definitely in receipt of "Charlie' time; pilots would plan their flights to return at one of the scheduled recovery times.—USS INDEPENDENCE

Mr. L. S. O. Confucius say: " 'Tis better to bolt, than to dive."—Ed.

Plane Pushers

"Assignment of individual plane pushers for each crew to specific positions on the aircraft would require no extra personnel and would decrease the chance of damage."—*From an Accident Report*

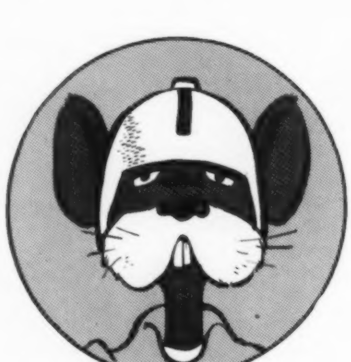
From an AAR

That during bad weather returning aircraft be handled by CCA, thus reducing radio traffic on any one frequency to a minimum.

From an AAR

That CIC aboard aircraft carriers be provided with facilities for recording appropriate radio transmissions.

QUALITY CONTROL; LACK OF



RECENTLY I was scheduled to fly the usual maintenance test flight on a P2V-5FS just out of 4th major check. Preflight inspection was thorough; run-up, taxi and takeoff seemed normal until the 10 degrees flaps were retracted at 400 ft. at IAS of 150.

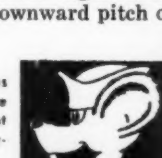
The nose pitched violently down giving the impression of run-away varicam down with the indicator still at about one-half degree nose down. I secured the normal varicam system and toggled the varicam to 4 degrees nose up indication by the emergency method. At this point the nose pitched up violently, giving the impression of run-away varicam in the emergency system to the UP position. The copilot at this point joined the battle to keep the bucking P2V clawing for altitude.

With both pilot and copilot seemingly lifting the errant *Neptune* to altitude by strength of arm and determination, level off and cruise condition was attained at 7000 ft. Elevation control throughout the flight appeared to be intermittent with a constant light vibration being fed into the yoke. In straight and level flight at 160 kts the varicam indicated 2 degrees nose up and under normal circumstances this should have been about 1 degree nose down.

We attempted to put the aircraft through the normal landing sequence at safe altitude and upon lowering 10 degrees of flaps the nose pitched up violently; this was overcome by nose down varicam and forward pressure on the yoke. As the aircraft came back to level flight there was a violent downward pitch of

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. As the name indicates these reports need not be signed. Forms for writing Anymouse Reports and mailing envelopes are available in readyrooms and line shacks. All reports are considered for appropriate action.

— REPORT AN INCIDENT, PREVENT AN ACCIDENT —



the nose.

Weight and balance of this bucking bronco gave the impression that our center of gravity movement was limited to the point of a sharp pin. The copilot expressed his sensation of the flight as an attempt to balance the aircraft on top of a bowling ball. We dropped the landing gear and went through the same routine, but it seemed less violent. Flaps were then lowered 20 degrees and the same violent routine was experienced until that critical point of balance was attained. Flaps were then put full down with the same routine. In the dirty condition at 125 kts the critical point of balance was attained at the 6 degrees nose-up varicam indication. At this point we determined that a safe landing could be accomplished at homeplate.

The aircraft was cleaned up and the maintenance test form completed while burning off some of the fuel load. The parent squadron was notified of our predicament and the Commanding Officer briefed the control tower personnel on the situation as best he could.

We were cleared for a long straight-in landing approach. Jets were started and put on the line in idle as a precautionary measure. The landing check-off list was completed at 700 feet about two miles from touchdown. Landing transition re-

QUALITY must be built into a product - - - it cannot be inspected into it.

quired full UP varicam to keep the proper nose high landing attitude but, the touchdown and landing roll-out was uneventful.

Upon postflight inspection it was discovered that airframes personnel had forgotten to secure the varicam-elevator inspection covers on the top side of the varicam control surface. These inspection covers are hinged along the forward edge, extend the full length of the horizontal stabilizer and provide true spoiler effect for the entire elevator surface when in the open position.

Changes in attitude during flight caused these inspection covers to open or close, thus causing additional change in attitude until that critical point of balance of forces was attained.

Responsibility for this occurrence lies directly with the Maintenance Department in that the aircraft was released to Operations for test flight prior to the normal quality control final inspection. The moral to this story is that quality control can be worth its weight in gold when correctly employed.

Check Mate

STRICT adherence to the preflight checklist saved a helicopter, and my neck, a few days ago. I have accumulated about 700 hours in the HUP-2 and during this accumulating period I have noticed pilots overlooking the item "free throw of all controls" or putting it off until after they were engaged. I must admit my own previous failures in this area.

The particular hop I have in mind was a maintenance test flight following a transmission change. Therefore I was a little more cautious than usual. Upon checking the controls I found I could not get full forward throw without an almost impossible effort. The well under the floorboards checked out O.K. and the qualified crew leader finally worked his way into the transmission area. There he found the rainshield on the forward transmission installed one-third out of phase (I understand it's easy to fit it in that way) and it thereby limited my full throw of the controls.

Had I been airborne I could have gone forward not more than one inch beyond neutral! Moral: Adhere to that checklist. It's a lifesaver.

Surprise

TWO hot lieutenants, of which I was one, with about 500 hours apiece in the Bug Smasher, took off from a California Air Station to pick up some passengers at a California Air Force Base. Upon landing at the AFB, we requested that only the wing tanks be filled.

After a quick lunch we filed for our home base and proceeded to preflight the SNB. Much to our surprise the line crewman complimented us and said that we "were the first Navy pilots he had ever seen preflight their air-

plane." With professional pride swelling our flight jackets, regardless of whether or not we were the first Navy pilots the line crewman had ever seen, we blasted off for home plate.

After breaking ground, fuel fumes filled the cockpit. As this is somewhat normal on occasion, we dismissed it as the fumes faded away. Near our destination we started descending and gas fumes filled the cabin once again. This puzzled us but we proceeded with the in-range checklist.

Then when switching around to a main tank we found, much to our chagrin, that the nose tank had been filled contrary to our instructions. We went to a high power setting and burned off one-fourth of the nose tank while stooging around the vicinity of NAS.

Somewhat disturbed at our oversight on the preflight checklist, we were further disturbed when the plane captain politely pointed out that the nose tank cap was not on the filler tube, and the covering flap was loose.

Our professional pride was completely shattered because we *must* have been the first Navy pilots that "other" line crewman had ever seen. Do you suppose it was his first airplane *too?*

Not So Hot

WHILE taxiing out for takeoff in a P2V-5F, the pilot asked a relatively inexperienced copilot to cycle the alternate air doors. However, he energized both to full hot. This pilot (hotter than most) made a steep climbout after an obstacle takeoff and commented that "This airplane sure needs a lot of throttle for takeoff power." Although I had not flown this particular plane very much, the indications should have been a clue to the reason.

Climbout was continued but the port engine started backfiring severely. Power was reduced on that side but the backfiring continued so we cut and feathered the power plant. At that time the engine gages were surveyed and when I realized the error in control settings I put the alternate air to cold.

Following an uneventful single engine landing the engine was inspected but there was no damage, except to the pilot's ego.

Dead Ahead

SEVERAL years ago I was pilot of a P4M taking part in a fleet exercise in the Med. At the conclusion of the exercise it was the habit of the P2Vs operating with us to make a simulated torpedo run on the nearest ship before returning to base.

Not to be outdone by the P2V drivers, I included a similar practice run in our preflight planning.

The exercise finished up at night with a complete overcast making things even darker but we figured this was no problem as we had landing lights to illuminate the low level runs. Radar soon picked up a ship, about 20 miles away, and I changed course for the run-in. The navigator requested permission to come up to the cockpit and watch, and receiving permission, worked out a heading and distance to base.

After making one run on an auxiliary vessel, we picked up another target very near our base course so we tried another run. After this one Radar was sure we had a carrier on the scope. This target too, was just a little off our course, so we made just one more run. Since the target was showing no lights, Radar gave us vectors for the run.

A couple of miles out it appeared as if there was a patch of fog at the ship's reported position. Not wanting to make any IFR runs we started our pullup early. About a mile out the landing lights were turned ON to see if we could make out the ship through the darkness. But all that came into view were trees and shrubs!

In our preoccupation with the game of torpedo runs, we had worked our way 60 miles off track. The last run for the night had been made on a small island (highest elevation 1700 feet). Considering that our run started at 500 feet it was lucky we didn't press on into the "fog."

After our max rate pull-up, two shaken pilots sent the navigator back to work, where he should have been all the time.

Have a problem, or a question?

Send it to

headmouse

he'll do his best to help.

QUESTIONS ANSWERED

Dear Headmouse:

1. What is the current regulation about the use of Hardman fittings or snaps to attach oxygen masks to hardhats?
2. What is the current regulation about use of reflective tape on hardhats?
3. Are any regulations in effect for shore-based aircraft concerning operation of single jet aircraft or sections of aircraft more than 50 or 100 miles off shore?

LT.

►*Hardman Suspension Kit:* Although the installation of the Hardman retention kit, in accordance with BACSEBs 17-58 and 17-58A, is not mandatory, installation is considered highly desirable and strongly recommended by NASC.

During 1959, not a single pilot with both the Hardman kit and the chin strap installed lost his helmet during ejection. During 1960, only one pilot with both the Hardman kit and the chin strap installed lost his helmet during ejection.

Reflective Tape on Pilot's Protective Helmets:—Increased detectability of downed aviators by visual means is highly desirable. The use of reflective tape on helmets is quite effective, and a more satisfactory means of increasing the detectability of downed aircrewmen than the heretofore used fluorescent paint. Primarily, the fluorescent paint used for this purpose is heat absorbing, which adds materially to discomfort in the warmer climates. Another reason is that the light reflected by the fluorescent paint has caused, in the past, some irritation to the nervous system. Also, the paint, when chipped or dirty, loses its effectiveness. The brilliance of fluorescent paints decreases with age. This results in decreased detectability or, if periodically repainted, a slight increase in helmet weight due to repeated application. When reflective tape is used, any damaged tape is easily removed and fresh, clean tape attached to renew its effectiveness.

Investigations of accidents have revealed that the detectability of downed airmen in both daylight and night hours by rescue personnel have been materially aided by the use of reflective tape.

NASC endorses and strongly recommends the application of reflective tape to helmets as outlined in BACSEB 1-60.

Single Plane Flights of Single Place Aircraft:—While there are no OPNAV INSTR., we believe the following from ComNavAirPac Inst 3710.10A is of interest:

"In the past, aircraft and pilots have been lost while flying single place aircraft unescorted. In many of these cases, an aircraft or pilot have been saved if another aircraft and pilot had been present. A chase plane is invaluable during high altitude flights where hypoxia may be experienced, on over water flights where survival depends on prompt SAR action and on familiarization flights where new pilots may require assistance.

"As a matter of general policy, sound practice should include the provision for a minimum of two single-place aircraft on all familiarization, over water and high altitude flights. It is not the intent of this Instruction to preclude individual cross-country flights within the provisions of reference (a), nor does this Instruction pertain to over water flights of single place aircraft engaged in utility operations, such as tow and CIC flights. While making such flights over water, each aircraft will be identified, located on radar and placed under positive control of using or monitoring activity. No single aircraft will proceed on the over water phase of such flights unless he has a radio homing device in operating condition. Further, if radio or radar contact is lost the aircraft will either proceed to the controlling station or to home base, depending on available fuel. In this connection no outbound vector will be held for a period of more than five minutes without receiving a communications check from the controlling activity."

Very resp'y,

Headmouse

The discretion and judgment you use before you meet with trouble will provide the loophole for escape. — *Jordanoff*

FLIGHT NOTES

Amen

Formation flight in helicopters takes a lot of skill and practice. Formation flight in helicopters at night takes even more skill and practice. Formation flight in helicopters at night under deteriorating weather takes more skill than most pilots ever gain and more practice than they ever get.—*"Crossfeed"*

Guard Interference Source

The source of unauthorized transmissions on guard channel in the majority of cases is ground control stations. Many controllers seem to be unaware of the extreme ranges such transmissions will carry, thereby causing interference with all aircraft at altitude within an extremely large radius of the source. It is recommended that the appropriate naval agency initiate further action to advise all controlling activities of the extent and indiscriminate use of the guard channel.—*From an AAR*

Runway Landing Incidents

THIS is the fourth accident I have been in on involving a DC-6 leaving the runway after landing on a wet runway with a high crosswind condition. The crew statements in all cases have been almost identical. The problems encountered were identical. In my opinion, the causes of this condition must be considered identical. As a matter of fact, this problem has been recognized for a number of years, but still exists and in all probability will recur in the future.

On some airlines, company procedure requires use of reverse propeller on all landings. In my view, this requirement is the primary contributing factor to this, and the other three incidents which, incidentally, all occurred in the New York area. There is no doubt but during the short time required to reach the reverse propeller condition, there is a time wherein the airflow over the control surfaces is disrupted. During this period of time, the high crosswind overpowers the ability of the control surfaces, and as a result the airplane actually becomes uncontrollable. Had the reverse propellers not been used in any of these four conditions, there is no doubt but what the incidents would have been avoided. Therefore, in my view, it is abundantly clear that the mandatory requirement for propeller reversing on DC-6 aircraft must be reviewed and procedures designed to permit utilization of this system if the pilot deems it appropriate. In addition, the pitfalls which can be experienced by reversing under similar conditions should be clearly outlined to the pilot group for their information. If this corrective action is not undertaken at an early date, we can assume that more DC-6s will be leaving the runway under similar conditions.—*ALPA "Tech Talk"*

Plane Sense

Crash Crews: Don't sit on top of crash trucks while helicopters are near—rotor blades are approximately the same height.

—Key West Safety Council.

In-Flight Vigilance

FOLLOWING is a general quote from the FAA: "It has been noted that some flight crews are lax in 'clearing the area' prior to making turns in holding patterns when flying on an IFR flight plan under VFR conditions. When VFR conditions exist, there is a strong possibility that there will be VFR traffic operating and it must be remembered that all aircraft are governed by the 'see and be seen' rule under these conditions. Since holding patterns are established near terminal areas, it is reasonable to believe there will be more VFR traffic near the terminals, and consequently, a greater possibility of collision, hence a need for even greater care in watching for other traffic."—*TWA Flite Facts*

How Small Is Small?

"SINCE fuel filtering is such an important subject and it is so necessary to keep minute particles out of hydraulic fluid, let's define microns, about which there is frequent mention: One inch, linear measure, contains 25,400 microns; and one micron measures 0.000039 inch. Red blood cells, 8 microns; white blood cells, 25 microns; no figures given for blue blood. These figures are from Vickers Inc."—*Flight Safety Foundation Bulletin*

If YOU don't stop accidents, WHO WILL?

C'est la Guerre

A less conscientious instructor would have taken control immediately when the aircraft bounced. A good instructor who lets the student keep control in less than ideal situations always runs the risk of a student doing the unexpected, such as nosing over from 6 feet of altitude.

From an AAR

That future aircraft designs include provisions for transmitting emergency IFF signals in the event of an engine failure or generator failure which removes the normal power source for IFF equipment.

Waistline Watcher

CONVERSATION between the Navy pilots overheard at a coffee break at Pt. Mugu:

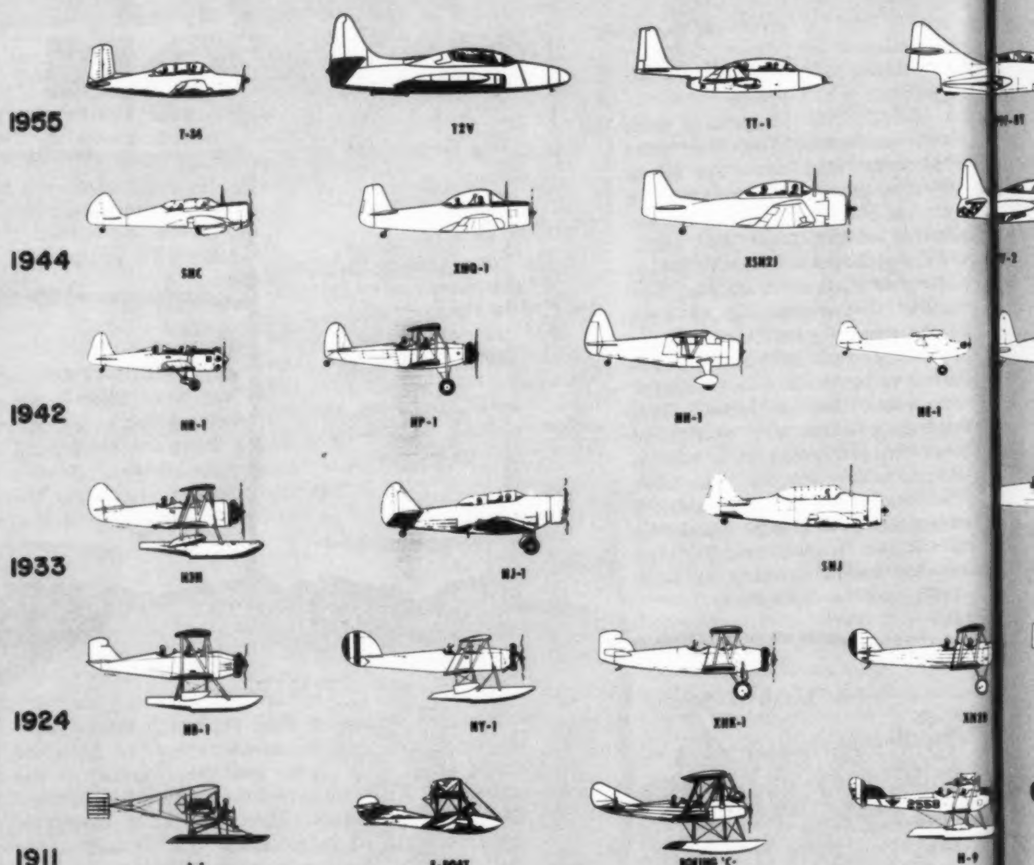
Have another donut?

No thanks, Haven't had my physical . . . besides, these jet cockpits aren't getting any bigger. —

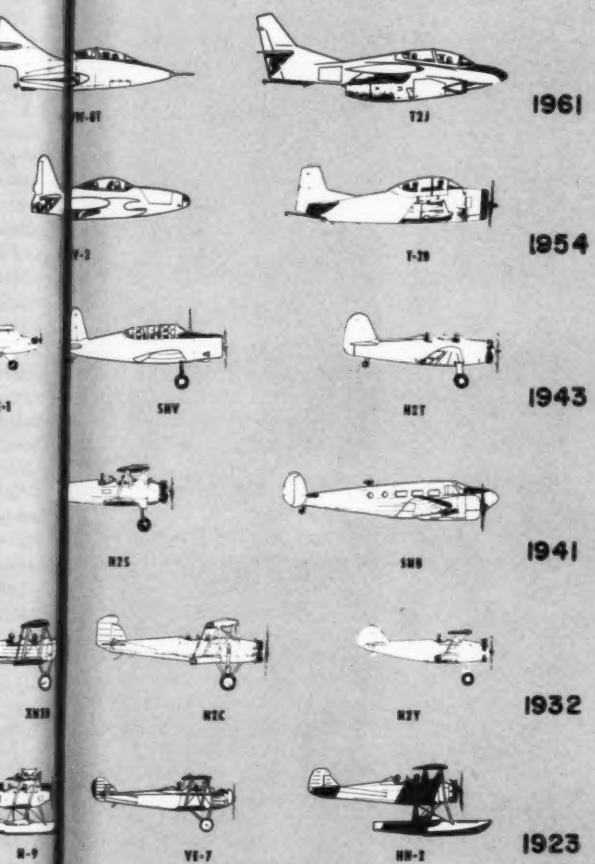
FUR Piece

A recent review of FUR reports indicates that, in many instances, duplicate reports of both the single sheet FUR form and the original of the eight-part FUR set are being submitted on the same failure incident. This duplication results in the tabulation of information that is misleading and precludes the development of accurate failure data and trends. In order to provide BuWeps, the contractor, and the manufacturer with factual data upon which to base corrective action or product improvement, it is requested that only *one* FUR report be submitted for each incident of failure malfunction and/or material discrepancy. *Reliability Requires Reporting Right Religiously.*

DEVELOPMENT OF U.S. NAVY T



AVY TRAINING PLANES



A PILOT'S memory of his early flying is always colored by the trainer used to initiate him into the mysteries of aerodynamics.

In sea stories about days gone by, younger pilots must always assume that an older trainer was (1) crude and unrefined by "modern" standards, (2) produced 100-proof he-men, (3) taught *real* airmanship, and (4) was positively the last Navy plane which was fun to fly: Men who learned in the fresh air pushers like the A-1 must have sniffed disdainfully at the Boeing "C" series and N-9 with such softening influences as covered fuselages, windshields and panels crowded with flight instruments (consisting of airspeed, altimeter and tachometer).

Until the late thirties, the syllabus stressed floatplane training. Landplane flying was a checkout after you had properly learned sailing and docking.

The training command has used many aircraft which do not appear on this chart. These were obsolete combat aircraft such as the BG-1, PD-1, F4B, and were used to bridge the gap between primary trainers and first-line combat aircraft. At present a similar use is made of the F9F-8B and F11F.

Urgent wartime need for trainers (both WWI and II) resulted in procurement of relatively unknown models. WWI examples would include the Burgess and McDonald twin-float biplanes. In WWII we got the Spartan NP-1 and NH-1 instrument trainer. The little Piper NE-1 was used at Elementary Bases (E-bases) though students referred to them as "Elimination" bases.

Fatigue

on the part of aircrews is a known factor in some aircraft accidents. It is a suspected factor in others—and possibly an unsuspected one in many more!

Less well known than aircrew fatigue, but probably an equal safety problem, is the part that fatigue plays in determining the efficiency of both shore and carrier based maintenance and support personnel.

But whether you fly, fuel or fix naval aircraft for a living, there's a good chance that you, the Navy and safety will profit by an observance of the common sense advocated in this article.

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Maybe You Need More Sleep

by Robert O'Brien

New studies show that neglect of nature's way of restoring our energy can cause mental and emotional damage.

ARE you getting enough sleep? Or are you a chronic stayer-upper at night? Recent studies suggest that on your answer may depend your relationships with others, your efficiency on the job, even your mental health.

For many years most doctors and scientists believed that sleep requirements varied with each person, so that no one could say how much sleep an individual needed in order to live and work at his peak. Today researchers are convinced that variation among individuals is considerably less than they once thought. "The pace and stress of modern life place increased importance on getting enough sleep," says Dr. George S. Stevenson of the National Association for Mental Health. "I believe it can safely be said that all human beings need a minimum of six hours' sleep to be mentally healthy. Most people need more. Those who think they can get along on less are fooling themselves."

Lack of sleep is frequently the real trouble with the husband who loses his temper at breakfast, the mother who flares up at her children or the man who flies off the handle at the office. Lack of sleep can make normally cheerful people feel moody and depressed. Intensified by still more lack of sleep, these signs of inner distress may spread like an infection into the crippling symptoms of real mental illness. And sleep loss is subtle poison; its victims are usually the last to realize what's wrong. Dr. Nathaniel Kleitman, the nation's foremost authority on the subject, puts it with convincing simplicity: "If we do not get enough sleep, we cannot be fully awake during the day." This is dangerous, because if we are not fully awake, we are not in our right minds.

The driving role of sleep loss in the nervous-breakdown pattern has been suggested by three Salt Lake City doctors—Drs. Eugene L. Bliss, Lincoln D. Clark and Charles D. West of the University of Utah College of Medicine. After studying two schizophrenic, or "split personality," patients who had suffered extreme sleeplessness during the period of breaking down, and seven medical students experimentally deprived of sleep, these doctors reported in the Archives of Neurology and Psychiatry, published by the American Medical Association, that "Many agitated persons on the brink of a psychotic break suffer from severe insomnia. . . . A few pass through a prolonged period of wakefulness as the schizophrenic process unfolds."

Whether sleep loss is a cause or an effect of the breakdown, it does appear to be part of the process. For this reason, anyone who simultaneously undergoes anxiety, social isolation and sleep loss may be setting himself up for trouble.

Why does the brain require sleep so desperately? No one knows exactly what sleep is, physiologically. It might be described as a kind of idling of the body mechanism. Muscles relax; body temperature and blood pressure drop. The brain waves—tiny electrical pulses that the highest nerve center, the cortex, emits at the rate of about ten a second while we're awake—gradually broaden to lazy rollers rippling out at the rate of two or three a second. The cortex itself closes down its billions of tiny nerve circuits, like a switchboard going dark for the night. Our plane of consciousness sinks low. As one doctor has said, "It's nature's way of recharging our batteries for tomorrow's work and play."

It is now evident that disturbances in behavior from lack of sleep closely resemble the disorders produced by certain narcotics, alcohol and oxygen starvation. Perceptions grow fuzzy. Our sense of timing is off. Our reflexes are a little late. Values slip out of focus. We are literally "not ourselves."

For the last three years experiments have been in progress at Walter Reed Army Institute of Research in Washington, D. C. Subjects—more than 100 military and civilian volunteers—have been kept awake for as long as four days. Thousands of tests have measured the effects on their behavior and personality. Results of these tests have given scientists astonishing new insights into the mysteries of sleep.

They now know that the tired brain apparently craves sleep so hungrily that it will sacrifice anything to get it. After only a few hours of sleep loss, fleeting stolen naps called "lapses," or micro-sleeps, occurred at the rate of three or four an hour. As in real sleep, eyelids dropped, heartbeat slowed. Each lapse lasted just a fraction of a second. Sometimes the lapses were periods of blankness; sometimes they were filled with images, wisps of dreams. As hours of sleep loss mounted, the lapses took place more often and lasted longer, perhaps two or three seconds. Even if the subjects had been piloting an airliner in a thunderstorm,

they still couldn't have resisted micro-sleeps for those few priceless seconds. And it can happen to you, as many who have fallen asleep at the wheel of a car can testify.

Another startling effect of sleep deprivation was its attack on human memory and perception. Many sleep-deprived subjects were unable to retain information long enough to relate it to the task they were supposed to perform. They were totally befuddled in situations requiring them to hold several factors in mind and act on them, as a pilot must when he skillfully integrates wind direction, airspeed, altitude and glide path to make a safe landing.

An obstetrician I know let emergency calls break up his sleep every night for weeks. Returning home exhausted one evening, he learned that another of his patients had arrived at the hospital. "The nurse gave me the patient's name, the time of arrival, and was describing the symptoms when I lost track of what she'd already told me," he said. "Then it got worse, I couldn't even grasp what the nurse expected of me." Badly shaken, he let a colleague take over—and slept for 13 hours.

Individuals who work at jobs which require them to hold many factors in their minds at once might well ponder these risks. A tired man may be able to get through routine tasks, but can he think creatively, can he organize, can he make decisions?

For most of us, the price we pay for staying up later than we should is common irritability. Dr. and Mrs. Graydon L. Freeman, Northwestern University psychologists, once set themselves an irregular sleep schedule of four, ten, eight and six hours a night. Dr. Freeman reported in the Journal of Experimental Psychology that by the end of the second week his "contacts with his colleagues were frequently tinged with caustic jibes, and the cantankerous outbursts which occasionally occurred between the two subjects were often quite uncivil." Ruefully he reported that "an overcritical attitude toward other individuals" was a chief result of sleep loss.

How does sleeplessness cause such irritability? Most experts answer that it tightens nerves and muscles, thus increasing tension. Dr. E. J. Murray, a Syracuse University psychologist, adds that frustration may be a factor. The need for sleep is a drive, like hunger. When we go without it, frustration of the drive makes us irritable and aggressive—just as hunger makes dieters ill-tempered.

The Freemans made another surprising discovery: the proverbial "one good night's rest" is not enough to put us back in shape. They found that they required at least two full nights of sleep, preferably more, in order to bounce back from a four-hour night.

Sleep loss is also a drain on vital energies. In an experiment at Yale University, students were asked to do difficult multiplication problems after eight hours sleep, then after six. Speed and accuracy were a little better after the sleep loss but metabolism tests showed that the same work exacted nearly three times more energy.

But why did their speed and accuracy improve? This temporary lift in performance is often a dangerous deception resulting from sleep loss. Under tension caused by fatigue many people feel "hopped up." Undergraduates who sit up late cramming for examinations often experience this temporary stimulation. If the examinations are brief, the student can probably profit by the heightened tension. But the lift is only temporary. After a few nights of insufficient sleep, work output begins to sag.

Night after night, many of us get by with anywhere from 15 minutes to two hours' less sleep than we need. (The margin between a good night's sleep and an insufficient one may be very small.) We may get away with it for months, even years, while the fatigue accumulates. Then, all at once—the pay-off.

A young, hard-working executive was the wonder of our neighborhood. "Most people sleep too much," he used to say. "It's all a matter of self-discipline. I trained myself to sleep five hours in college and that's all I've ever needed." Last summer he collapsed. His doctor called it "nervous exhaustion."

Millions of people stay up late simply out of habit. Many feel that late-evening hours are the only ones they can call their own. Tired housewives, for example, who have finally put their children to bed feel that now, at last, they're entitled to a little time to themselves. They guard these moments jealously, against all pleas that they get to bed. But the price of that extra hour is stiff.

Many late stayer-uppers hang on simply because they are dissatisfied with how little they have accomplished during the day. The irony is that if they got the sleep they needed their days might be better balanced—with a greater satisfaction in getting chores done, and with many small periods for rest earned by greater efficiency.

Others stay up because of worries and anxieties. But, paradoxically, sleep is one of the best antidotes to worry. My doctor puts it: "First, take care of your sleep. Then most of your worries will take care of themselves."

The time spent in sleep is not lost. Adequate sleep is an essential ingredient in producing joy in life—that sudden rush of well-being that sometimes sweeps out of nowhere and makes us glad to be alive.

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Mirror, Mirror!

ON a VFR local air-to-air gunnery hop, an F8U-2 pilot ejected after engine failure in flight. (He was unable to restart the engine due to loss of primary aircraft electrical power and failure of the extended Marquardt unit to provide emergency electrical power.)

With wings level in a 200-knot glide at an altitude between 6400 and 7000 feet, the pilot closed his eyes and pulled the face curtain. He had no trouble bringing the curtain over and down although the seat had been raised to its highest position and his helmet visor was up.

He was aware of a mild ejection jolt . . . tumbling through the air . . . seat separation . . . and being in a flat spin which he stopped by extending his arms and legs. His parachute deployed "as advertised" with an easy shock.

His bailout oxygen system worked well but after he released one lower rocket jet fitting, the oxygen hose stretched and seemed to pull his mask and head down. Fearing this would impede his progress when he hit, he pulled out the oxygen hose, released his Hardman fittings a notch and breathed around the mask. He kept the mask in place against his face for protection on landing. His helmet chin strap was still tight. He pulled his D-ring so that he would have to actuate only his top two rocket jet fittings to rid himself of the parachute canopy on touchdown.

Then he realized that a strong surface wind was blowing him rapidly backward away from the desert floor and toward the rocky mountain slope. Twisting motions helped him turn left for the impact and he hit with a ground speed of 25 knots on a sharp incline covered with scattered rocks and boulders. He remembered his training about "rolling with the fall" but decided he couldn't apply it to this situation. As he was being dragged up the rough slope by the chute, mostly on his left side, his main thought was to keep his head off the ground and stay away from the rocks. When his risers fouled on the rocks and his parachute was finally stopped, he was able to release his canopy and other lower rocket jet fitting.

He found he could walk. His left hand was bleeding but not severely. He had lost his kneeboard and .38 revolver—belt and all—but had retained everything else. His extra signal mirror in the left leg of his flight suit had shattered, rupturing the left leg bladder of his anti-G suit, but the pieces still adhered to the plastic backing. Holding these as flat as possible, he signalled the orbiting aircraft and waved to indicate he was all right. Helicopter pickup followed.

Medical examination showed that he had no broken bones although he was banged-up considerably. After two days of cold packs and bed rest, he was returned to full flying status.

* * *

Here is a rundown on the personal equipment and survival aspects of the accident:

● *Training:* The only question raised in the pilot's survival training, the reporting flight surgeon states, is whether he actually knew that a signal mirror was part of his seat pack equipment.

● *Oxygen Mask:* The pilot pulled his D-ring and released one of his lower rocket jet fittings in accordance with squadron refresher training. When he released the left fitting, allowing his seat pack to hang by the right strap, his bailout bottle hose stretched so that it restricted his head movements. He unplugged his hose, loosened the Hardman fittings and breathed around the mask.

● *Flight Suit:* The pilot's summer flight suit was badly torn and shredded along his left shoulder, hip and leg in areas corresponding to his skin abrasions but it was basically intact.

● *Helmet:* The pilot's APH-5 helmet had scratches in several places and a small partial puncture . . . evidence of how it had protected the pilot's head as his billowed chute dragged him over the rocks. The helmet had nape strap and chin strap; the chin strap kept the helmet on the pilot's head after he had loosened his Hardman fittings.

● *Gloves:* The pilot's gloves were badly torn, especially the left one.

● *Signal Mirror:* The pilot's extra signal mirror was badly shattered but was still usable due to the shatterproof plastic backing. Reports of witnesses emphasized the efficiency of this type of signaling device. In spite of the fact that the pilot had to hold the pieces in a flat plane during use, the mirror was an effective signal.

TRANSFER AT SEA

As the F3H-2 was shot off the cat, flames and sparks were emitted from the tailpipe and bleed ports. Simultaneously the throttle moved aft pulling the pilot's fingers from the catapult grip. The engine continued spewing flame and sparks until the aircraft struck the water approximately 150 to 200 yards ahead of the ship. (It is suspected that the engine shifted aft on the cat shot.).

As the aircraft left the flight deck the pilot pulled the gear handle UP, actuated the emergency canopy OPEN handle and held a 10-to-15-degree nose-high attitude until striking the water. When forward motion ceased, the pilot pulled the emergency harness release handle, stood up in the seat, released the parachute pack by actuating the upper rocket jet fittings and dived over the port side with the seat pack still connected. When clear of the aircraft he inflated his MK-3C life preserver.

The aircraft's vertical stabilizer and canopy were still above water as the ship passed about 40 yards to port. The pilot was spotlighted by the carrier's searchlights as he passed down the starboard side and waved a "thumbs up" to indicate that he was not injured. He made several attempts to remove the life raft from the container but was unable to locate the lanyard. Since rescue seemed close by he abandoned the effort and concentrated on signaling with the day and night ends of his two distress signals and his personal red-lens, two-cell flashlight. A motor whaleboat from the destroyer rescued him from the water about 10 minutes after the accident.

This was the first successful ditching by a pilot wearing an integrated torso harness in a Martin-Baker seat. Here is the pilot's description of his escape:

"Taxi to the starboard catapult was normal and I informed the tower that I had 4600 lbs. for the launch; 4000 lbs. internal and 600 lbs. in the wing tanks. On the catapult officer's signal I jam accelerated and all was normal—RPM 99.5, TOT 677, oil pressure 70, hydraulics both 3000 lbs.

"I braced myself and grasped the catapult throttle grip (which I had extended when flaps were dropped, just before taxiing on the catapult) with four fingers, holding the throttle in the yoke of my thumb and first finger. The initial part of the stroke seemed normal but before I could drop my eyes to the artificial horizon (which I usually do about ¼ way down the track) the throttle was jerked violently full back, pulling my fingers out of

the grip. At the same time I heard a loud crack aft of the cockpit. It was a crack rather than a boom in that it was sharp and rapid. This was followed by a screeching metallic noise.

"My first thought was that I had better get into afterburner since I had lost my thrust but the throttle didn't budge a hair. I think I decided at this point that the engine had shifted aft. I had read of this happening and the fact that the throttle was pulled aft when it happened stuck in my mind. I recall having time to raise the gear and try to set up the plane for a ditching. I blew the canopy open but I did not glance at the attitude nor do I recall what I used for a reference for attitude or what I did with my left hand after opening the canopy.

"The first impact was severe and cracked my teeth together. I got the impression that the plane bounced and I had a definite impression that it yawed to the left. My recollection of the second impact is vague but I pulled the guillotine handle when I thought I had stopped in the water.

"I stood up sharply and felt as though something was caught. I then stood in the seat and released the chute clips but I was still feeling as though I was not entirely free. I realized then that the seat pack was down around my calves and was giving me the feeling of being caught so I went headfirst out the port side. I pushed away from the leading edge of the wing with my foot. It was not too difficult staying afloat even with life preserver uninflated. I drifted away from the plane and pulled the toggles on the life vest—they worked fine. As I passed down the starboard side of the carrier I gave them a thumbs-up to let them know I was not hurt. They had several lights trained on me.

"At this time I began reaching for the lanyard to the raft but kept getting the hose from the emergency oxygen bottle. As the carrier went by fairly rapidly, I saw a destroyer coming up and I pulled a night flare. When that went out I used the day smoke end also. Since I was doing very well with just the life vest and was having such a time finding the raft lanyard, I thought I would concentrate on signaling for the time being. I pulled the other night flare and again the day smoke. (The personnel on the destroyer bridge said they saw the smoke.) I thought I saw the light on a small boat, so I yelled and whistled and found my red lens flashlight still in my anti-G suit leg pocket. I held it up and it worked.

"The whaleboat came up to me and they hauled me aboard. . . ."

The flight surgeon makes the following comments on the survival episode:

"The pilot quickly analyzed the emergency situation and took the correct measures for a successful ditching at night. He released himself from the seat and escaped from the cockpit without significant difficulty. It is noteworthy that the squadron had a full briefing on ditching procedures and indoctrination in escape from the Martin-Baker seat five days prior to this accident. The briefing was given in anticipation of the coming weeks' night carrier work with the newly introduced Martin-Baker seat and its timing was most appropriate.

"The pilot was familiar with the ditching procedures and confidently freed himself from the seat in complete darkness. He attributes his successful escape in large measure to this knowledge. The necessity for frequent emergency procedures briefings at the squadron level cannot be emphasized too strongly as this case points out."

HYPERVENTILATION

THE NavCad launched in a T2J-1 on a routine acrobatic training flight in the early afternoon. Preflight inspection and warm-up were normal except that an oxygen warning light was ON. The student pilot did not consider this abnormal, however, because it had happened before with an apparently normal oxygen system.* He also observed a sticking inhalation valve in his mask which occasionally made exhalation difficult. This didn't worry him either—he had had this trouble ever since he'd been using the mask. It seemed to occur mainly after voice transmission and he'd found he could correct it by blowing forcefully.

The weather was clear with slight haze in some areas. Takeoff was normal. The student proceeded to the assigned practice area and began his maneuvers between 12,000 and 20,000 feet—loops, barrel rolls, half Cuban eights, immelmans and power off stalls.

Prior to the flight he'd had a slight headache but while he was checking the aircraft and proceeding to the practice area, his headache disappeared. After several acrobatic maneuvers, he noticed the headache had returned and was gradually becoming worse. He felt dizzy and nauseated. His vision was a little fuzzy around the edges and narrowed slightly and he saw spots on the sky.

"One more maneuver," he thought. "Then if I don't feel any better I'll return to base."

He doesn't recall the maneuver or even if he had completed it at the time of ejection. . . . The next thing he remembers is the sound of a helicopter.

To make a long story short, a T-34 pilot spotted the student's parachute descending and re-

* With the oxygen system warning light ON all the time, the pilot would have no indication of a failure of the O_2 system unless he continually monitored his gages for quantity. With the O_2 light ON he also had no way of determining pressure in the system.

notes from your FLIGHT SURGEON

ported the ejection. Meanwhile, a civilian fisherman found the student suspended in his chute from the top of an 80-foot tree in a cypress swamp. The fisherman cut down enough small trees to clear an area for the helicopter to lower a flight surgeon. The two men then freed the student and carried him to the riverbank on a stretcher made of tree trunks and parachute material. At the river, they put him in a small motorboat and carried him three miles upstream to a spot where the helicopter could land. His only injuries were bruises of the neck, legs and arms and mild shock.

The reporting flight surgeon believed hyperventilation was the cause of the student pilot's troubles.

"Material malfunction (of the mask) is considered a significant contributing factor in this accident," his report states. "The improper working condition of the mask and regulator probably predisposed the pilot to hyperventilation."

. . . And it should go without saying, when a warning light is ON, you shouldn't take off.

Helo Lap Belts

"All three crewmembers of the HSS-1 unfastened their lap belts immediately after contact with the water. It wasn't very many seconds before they realized the mistake they had made. When the still-turning rotors contacted the water, the jolt displaced both pilots in the cockpit and could have injured or disabled either or both of them, possibly even impeding successful escape. The crewman was sufficiently braced so that he was not displaced. Since the accident they have all made it a point to recommend to others in similar circumstances that the lap belt not be unlatched until the rotor has stopped."

—*From an MOR*

"During helicopter ditching operations pilots and crewmembers will keep seat belts, shoulder harnesses and protective helmets fastened until the rotor blades have ceased movement."

—*OpNavInstr* 3710.7A

Fuel Pit Fire

An A4D-2 had been taxied into the refueling pit after a regularly scheduled night flight. After shutdown, as the plane captain was helping the pilot out of the cockpit, one of the wing walkers volunteered to handle the refueling nozzle. He was qualified to do so although he had never performed this duty at night.

After attaching the nozzle, he turned on the flow control handle and called for pressure. Fuel began spraying from the nozzle connection up into the after engine compartment. As the wing walker reached up to tighten the connection the nozzle fell down from the receptacle. Yelling for the pressure to be turned off, he turned the nozzle flow control handle off. Immediately thereafter the fuel was ignited, probably by residual heat in the after engine compartment.

Fuel which had soaked the wing walker as he had tried to stop the flow from the nozzle now ignited. His clothing aflame, he began to run away from the burning aircraft. He was stopped some 30 to 40 yards from the fire by the pilot and a line crewman who beat the flames out and rolled him on the concrete.

All personnel should be aware of the dangers of fuel-soaked skin and clothing around a hot aircraft, the AAR states. Had the wing walker evacuated the area as soon as he was splashed with fuel, before the fire started, his chance of injury would have been markedly reduced.

Rescue Aids

The pilot was carrying two MK13 Mod 0 flares and a .38 caliber service revolver with tracer ammunition. Also, his APH-5 helmet was covered with reflective tape. He utilized both the tracer ammunition and the night flare. Both were visible to the SAR helicopter and made the pilot's location and rescue less difficult.—*From an MOR*

SIGNALS

There was no moon and the use of the whistle by the pilot was of tremendous value in locating his position. After being brought aboard, the pilot indicated that only the last of his four flares lit for a reasonable period and his only recourse was to blow the whistle and wave his vest light. Two flares were duds and one functioned for about five seconds. He had not thought to use his pistol which was loaded with tracers. However, said pistol was found to have a defective firing pin when it was cleaned by the ship's gunner's mate.—*DD Skipper*

FIRE DIVE!

As THE pilot of an AD5N was leading a flight of six to the target area, he was notified by his wingman that he was trailing white smoke from the portside of the engine. Returning to base, he called the tower, declared an emergency and was given permission for a straight-in approach. He at this time could not detect any smoke from his position in the cockpit.

As he was passing through 2000 feet, the portside of the engine suddenly burst into bright orange flames extending back past the cockpit. He saw the flames along the left side of the plane and, realizing he was on fire, he pulled the mixture all the way back and cut the switches. Within seconds, flames burst into the cockpit near his left foot. He popped the canopy, then decided against bailing out because 1) he would have to go through a wall of flame, 2) he was about 1500 feet above sea level and 3) he thought his parachute might be on fire.

Nosing the plane over sharply, he "practically dove" for the water, leveled off and pulled back hard on the stick. He had his legs on the instrument panel at this time in an attempt to get them out of the terrific heat.

The aircraft's tail hit the water. The plane swerved to the right as it came to a halt. The fire was extinguished on impact with the water.

Here is the pilot's narrative:

"When the plane stopped, I unfastened my safety belt. I got clear—I just gave myself a good push out of it. I pulled up to a crouching position and stepped out of the cockpit. At first I couldn't find the toggle on my mae west. I didn't realize it but my hands were burned a little. Finally I pulled one of the toggles. Then my next problem was to get my oxygen mask off. I guess it saved my face and saved my throat from burns but I couldn't breathe when I was in the water with it. I had the devil's own time trying to get it off with my two raw hands. I'm not sure whether I broke it or not. Then I got my helmet off.

"I still had the parachute harness on and I had to get that off. I couldn't swim very well with it. I wiggled out of the parachute harness. I had a hard time getting out of it and then I realized after I got it off that the life raft lanyard wasn't attached to my life vest but by this time my hands were so sore that I just couldn't do anything about it. But I floated real nice. I knew I was burned pretty bad. I didn't have much of my flight suit left. My gloves were gone and I didn't see any signs of them.

"It seemed like I waited quite awhile for the helicopter (actually it was about 20 minutes). I never used that seat deal before. The helo came right on a line out of the sun and came right up to me with the seat lowered into the water and all I did was spread my legs apart and get hold of the line. It sure worked fine. I had a hard time hanging on though; my hands were so stiff and sore. I like to froze, I was so cold."

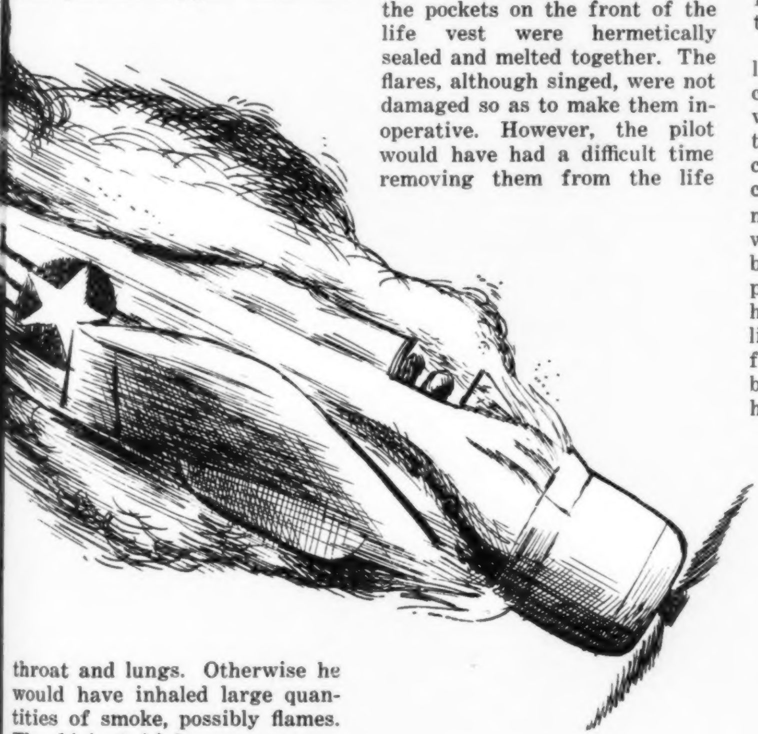
This accident vividly illustrates the effectiveness of safety and survival equipment. "It is nothing short of a miracle that a man should survive who was subjected to heat and flames of such magnitude that they melted aluminum panels," the reporting flight surgeon states. "These

flames must have been present for at least one or two minutes."

Here is a rundown on the performance of the pilot's safety and survival equipment:

APH-5 Helmet: The paint peeled and charred superficially. The visor was used until the flames caused it to buckle somewhat; then the pilot pushed it into the visor shield because he thought the visor was going to burn. However, the lowered visor had protected his eyes. Inspection of the visor after the accident showed only slight warping with no fogging or discoloration.

Oxygen Mask: The pilot's use of 100 percent oxygen saved his throat and lungs. Otherwise he would have inhaled large quantities of smoke, possibly flames. The ¼-inch high pressure oxygen line to the regulator did not burn through. Had it done so, the fire would have been explosively fed by the remaining oxygen. The supply line from the regulator burned through seconds before the ditching.



Gloves: Standard issue flight gloves were being worn but were completely consumed by the fire.

Life Raft: The life raft was available in the seat pack. When the pilot removed his parachute harness he lost the life raft because he had failed to snap the life raft lanyard to his life vest.

Shoes: The pilot's high leather N-1 field shoes protected his feet. Neither foot was burned. The laces of his left shoe were burned and he lost the shoe in the water.

Life Vest: The mae west provided much protection from the fire and although damaged from the heat, operated normally. All the pockets on the front of the life vest were hermetically sealed and melted together. The flares, although singed, were not damaged so as to make them inoperative. However, the pilot would have had a difficult time removing them from the life vest. The life jacket and the back of the seat protected the pilot's back from burns.

Flight Suit: The legs and arms of the flight suit were burned with the seams withstanding the heat better than the single layer of cloth.

Survival Knife: The pilot's survival knife was still suspended from the adjusting belt at the right side of his flight suit.

"All of the pilot's safety equipment functioned extremely well," the flight surgeon states. "In a fire hot enough to melt aluminum it is surprising that the pilot even survived and I think the fact that he did survive is due to the excellence of this equipment."

"This landing was accomplished under *extremely* difficult conditions as far as the pilot was concerned and it is some tribute to his great skill and courage that he was able to accomplish this in the outstanding manner that he did. The fire was immediately extinguished by the water and by the stoppage of the engine. Beyond this his survival training and will to live enabled him to free himself from the airplane and encumbrances and to effect an assist in his helicopter rescue."—*AAR*

RESEARCH IN MAINTENANCE

Is Research a profitable tool in a squadron maintenance organization? Airborne Early Warning Barrier Squadron Pacific gives its answer.

THE definition of Research spelled out in Funk & Wagnall's Desk Standard Dictionary is—"Continued and diligent investigation;—in Science—a systematic study of certain phenomena by the experimental method." Since our concern is with maintenance, and not with science, we have chosen the definition—"Continued and diligent investigation," and attempted to apply this "Research" to Maintenance. Logically, research in maintenance fits precisely as a tool for Quality Control. Let's take a look at AEWBarRonPac's "Research in Maintenance" program.

Why?

Ideally, each major discrepancy caused by a malfunction of the aircraft or its equipment, which results in a delay or an abort, should, at the very least, be channeled through the "Research in Maintenance" program, under the auspices of Quality Control, for the purposes of conducting a "continued and diligent investigation" in order to determine the answer to the fundamental question, *Why???* Why did the discrepancy occur? Was it a faulty part? If so, why was the part defective? Was it an error on the part of maintenance department personnel? If so, why was the error made? Was it a design error in original conception of the part? If so, has it been reported to BuWeps and ComNavAirPac, and why has it not been corrected? Was it a result of faulty operational procedures? If so, why are the procedures not changed? Was it the result of unusual wear? If so, what is the cause of the excessive wear? Was it the result of undetermined causes? If so, why cannot these causes be determined?

Parts Replacement?

Good Quality Control procedures require the determination of the basic *Why* of every discrepancy. It is usually a relatively easy matter to discover which part has failed, or is malfunctioning, and to replace the part or correct the malfunction. In far too many discrepancies this is the extent of the corrective action taken, and no thought is given to the underlying *Why* of the original failure. For Quality Control, discovery of a malfunction is the beginning of efforts to prevent a recurrence.

Analyze?

A discrepancy may result from a defective part. The Quality Control organization must try to determine why the part is defective. Is there any evidence of rough handling which may have damaged the part before it was installed? Perhaps Supply or Ready Issue handling procedures are at fault. Is there a history of previous early failures of the part? If so, perhaps the specified life-expectancy is too great, and the part should be changed as a matter of routine at shorter intervals. These and other similar questions should

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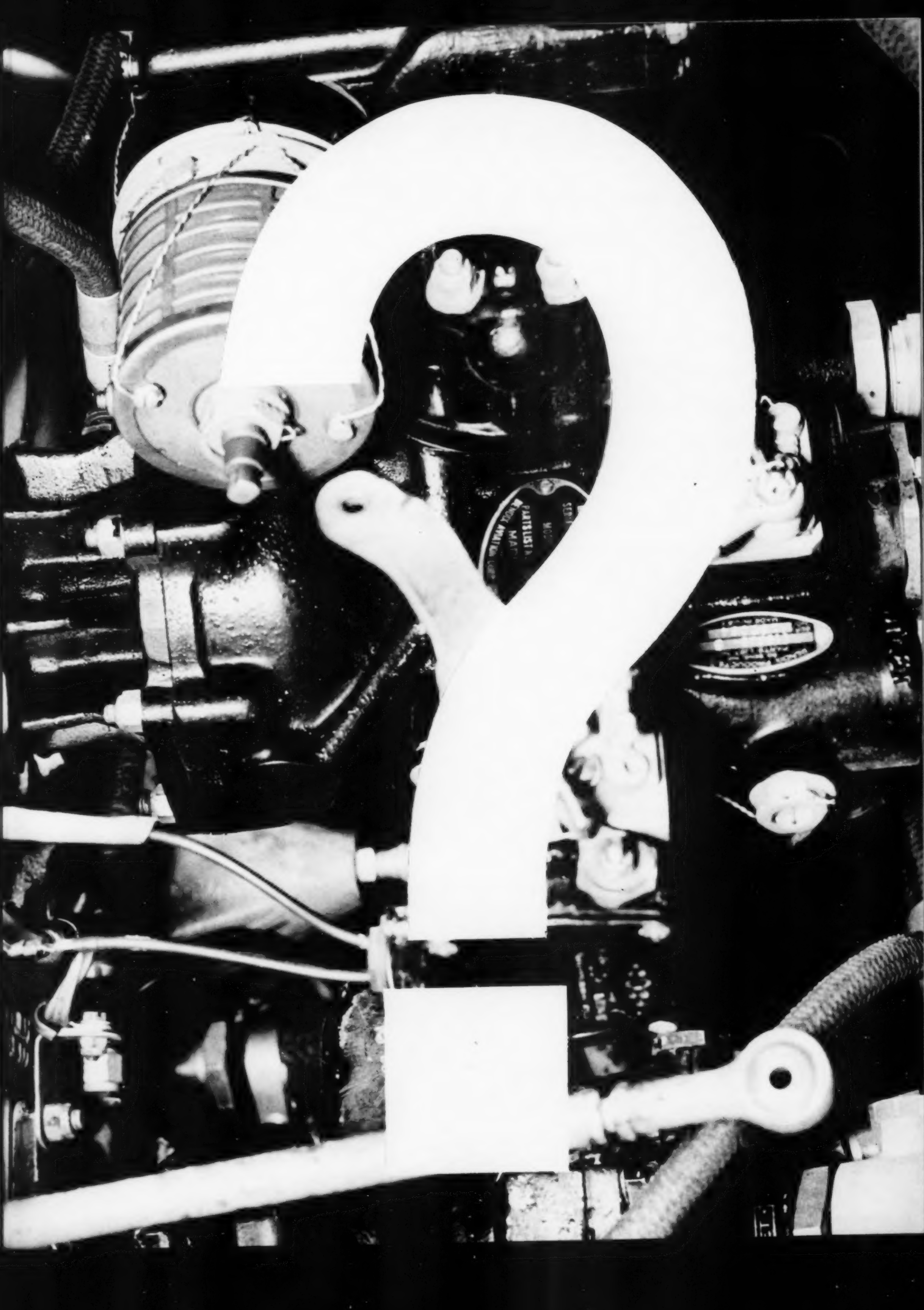


be answered each time it is necessary to replace an item of equipment prior to expiration of the specified useful life.

Fix the Blame?

A mechanic may have failed to torque a nut properly, resulting in a discrepancy. Too often the mechanic is admonished for his error, and that is the end of the matter. In a great many cases it is possible to discover the basic *Why* behind the personal error and correct the fault at its source. Perhaps it is a simple matter of lack of training. Perhaps the maintenance schedule is geared so high that personnel do not have sufficient time to do a first-class job. Perhaps there are personal problems, fatigue problems, or problems of motivation, which can be corrected. It is just as essential to try and ascertain the *Why* of human failure as of mechanical failure, and Quality Control must appreciate this fact.

Design Error?

A part may have failed. Research may indicate the failure to be a result of the design. Has the fault in design been previously reported? Are steps being taken to correct the original design? What can be done, if anything, as an interim measure to minimize the effects of the defective design?

Operational Error?

Was the failure a result of faulty operational procedures? If so, are the procedures themselves at fault, or is this a result of improper execution of recommended procedures? Is this an isolated instance? Why are the procedures in error, or why are they not executed properly if this is an instance of faulty execution? Is there a requirement for more training, better indoctrination? What can be done to correct the faulty procedures which resulted in this failure?

These are some of the *Why's* Quality Control must seek to answer to be really effective. There are many more that could be listed, but these will serve to illustrate the reason AEWBarRonPac considers the *Why* of each discrepancy as the starting point of its program of research in maintenance, and an indispensable part of Quality Control.

Who?

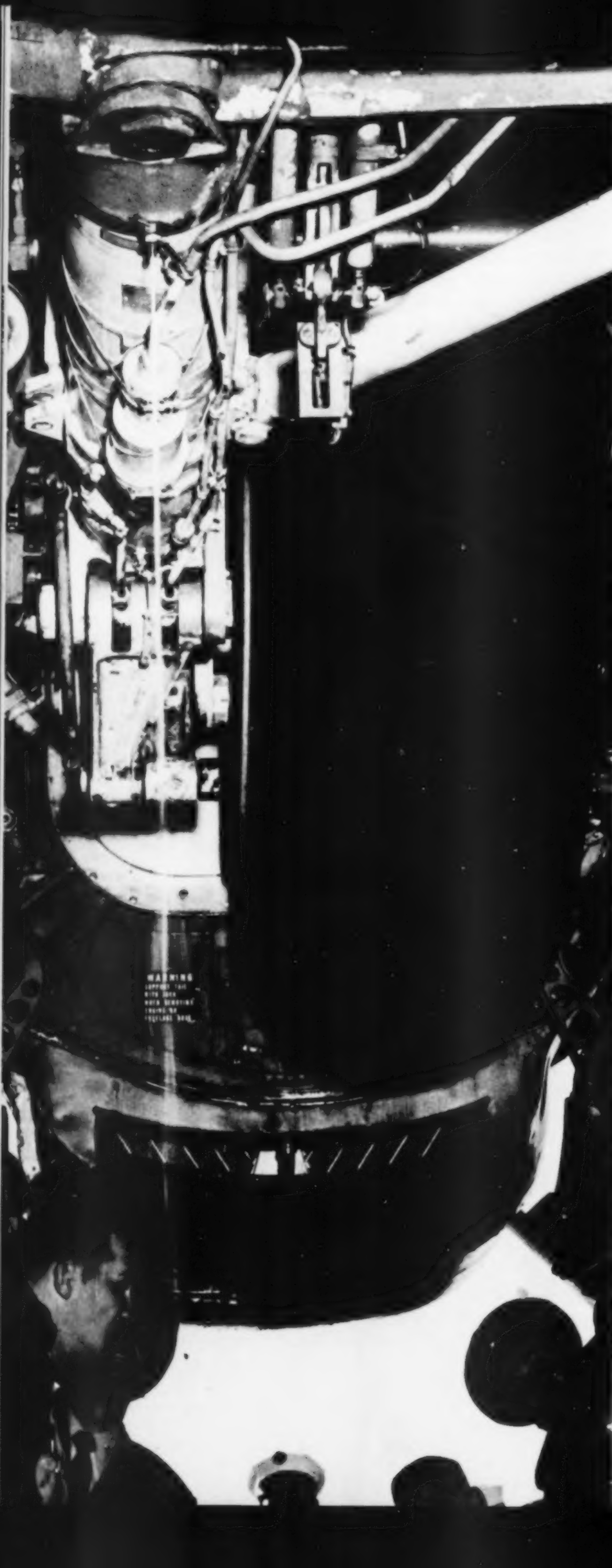
How does the AEWBarRonPac Quality Control Program function? Who looks for the *Why* when a discrepancy is discovered or reported? What is done with the information obtained, and who does it? Here is a brief description of the Quality Control organization within the AEWBarRonPac maintenance department, and the way it functions. Not always does it perform as outlined here, but this is the goal towards which Quality Control is pointing, and the nearer they come to this goal the more effective the program will be.

Quality Controllers?

Each division has furnished one or more of its most highly trained and skilled personnel as a Quality Control Inspector. These personnel work directly for and report directly to the Quality Control Division Officer, who, in turn, reports directly to the Maintenance Officer. Quality Control personnel are designated Inspectors, but are not pri-

marily concerned with inspection of finished work —although this is one of the functions they perform. AEWBarRonPac believes that quality cannot be inspected into the finished job, but must be incorporated as the work is performed. For this reason the Quality Control Inspectors concern themselves with the procedures utilized and the basic quality of the work performed as it is being accomplished, and finally, of course, with the finished product. Faulty procedures, personnel performance, or malpractices discovered are investigated by the Quality Control Inspector in an effort to ascertain the *Why* thereof, and are reported to the Division Officer and to the Quality Control Officer. If the *Why* of the faulty performance is discovered, the Division Officer, or the Maintenance Officer, if necessary, takes the action required to correct the problem. If the *Why* cannot be definitely ascertained by the Quality Control Inspector, the Quality Control Officer and the Divsion Officer of the shop involved conduct additional investigation in an effort to discover the basic reason for the error or discrepancy so that

AEWBarRonPac Maintenance types (l to r) H. J. McKenna, AE1, W. R. Tillman Wright Rep, E. L. Oxford, ADRC, CDR J. C. Snodgrass, Maintenance Officer and LCDR D. C. Hanna, Quality Control Officer inspect prop governor.



corrective action can be taken.

Each Quality Control Inspector, in the same way, investigates discrepancies discovered as a result of periodic checks, flight crew reports, or test flights, in an effort to learn the why of each discrepancy. Results of these investigations are again reported to the Division Officer and the Quality Control Officer for corrective action, or for further investigation if necessary. Quality Control Inspectors, although they report results of their observations, inspections and investigations to the Division Officer concerned for information, do not work for him, but work for and are directly responsible to the Quality Control Officer.

The Quality Control Officer works directly for and reports directly to the Maintenance Officer. As Quality Control Officer he is responsible for a continuing analysis of all discrepancies discovered, both material and personal, and for ensuring that sufficient investigation of each discrepancy is made to provide, if possible, an answer to the *Why* of the discrepancy. He must maintain charts, comparative data, history of previous failures, life-expectancy information for equipment and such other information as may be required to enable him to spot any problem area in the maintenance of quality control standards throughout the Maintenance Department. Ideally he should be able to recommend a solution for the problem to the Maintenance Officer, but if the problem is especially difficult it may require the efforts of the Maintenance Officer, the Quality Control Officer and appropriate Division Officers to arrive at a final solution.

Pay Off?

This comprehensive Quality Control Program has paid off for AEWBarRonPac, and has enabled the squadron to fly the WV-2 aircraft around-the-clock, on a rigid launch schedule, with a minimum of time lost from barrier operations. Airborne Early Warning operations are a grueling test of quality control procedures, but a check of the percentage of assigned mission time flown by the squadron will verify the effectiveness of quality control procedures used.

Before the Accident

AEWBarRonPac Aviation Safety Officer's comment: This Research in Maintenance program tries to discover, before the accident, the maintenance error or material malfunction which might result in an accident. Perhaps in this way the accident can be avoided altogether, and the Aircraft Accident Board will not be called upon to conduct their investigation to find the answers to these same questions.

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VP-48 Explains

Control Trials and Tribulations

THE Quality Control Officer is selected from those officers who previously have had experience as a division officer in the Maintenance Department. With such a background, he is better able to understand the problems and capabilities of the Shop/Hangar and Line Divisions.

Men who are designated as quality control inspectors are assigned to the Quality Control Division. Their primary duty is to inspect all work performed by the Shops/Hangar and Line Division within the area for which they are designated as inspectors. This arrangement has proven to be very effective.

Originally, all inspectors were assigned to and worked out of the various shops, the theory being that this would make the inspectors available to assist the shops with their workload. The unforeseen then began to occur. A job would be completed and ready for inspection and the inspector would be tied up doing another job. This required that the inspector delay the inspections or the job that he was performing. Consequently, the shops asked for more inspectors to be designated to prevent delays in inspections.

Eventually the inevitable came to pass; inspectors were inspecting work they had performed, and the number of designated inspectors rose to the point where approximately 25% of the available maintenance personnel were Quality Control Inspectors and still more were needed. The problem appeared to be too many inspectors; therefore the number was reduced to an absolute minimum with instructions that inspectors would be used only for inspections and they were not to assist the shop in their work. This arrangement temporarily alleviated the problem.

Then the inspectors, due to heavy work loads, began once again to assist or work off discrepancies and the same problem recurred. The shops requested more inspectors to be designated. At this point, it was decided to transfer all inspectors from the Shops and Line Division to the Quality Control Division and have them work directly under the Quality Control Officer. This system has been in effect since March 1961 and has been found to be most efficient. To further remove the inspectors from their respective divisions, an office space was procured for the inspectors to conduct planning and prepare inspection forms.

The advantages gained from a separate Quality Control Division are numerous. By taking the inspector completely out of his respective shop he does not feel obligated to approve questionable work performed by the shop. Also, the depth of the inspection is greater and more thorough. The inspector, under these conditions, does not rush the inspection for he has no other workload assigned. The main advantage is the Quality Control Officer has direct contact with his inspectors and closer supervision is maintained without going through another division.

In selecting inspectors, the primary considerations were: knowledge of the aircraft systems encompassed by their rating specialty, ability and motivation for designation as a Quality Control Inspector.

The inspection of ASW systems for calibration has been added to the Quality Control Division as an additional function. In addition to testing for calibration and alignment of the integrated data display system, the ASW quality control team teach calibration procedures. This has enhanced the reliability and readiness of the systems and operators. In addition, the Quality Control Division inspect aircraft prior to acceptance for discrepancies and make an inspection of each aircraft between calendar check periods.

In conclusion, the following recommendations and observations are made:

►The organization as set forth in BuWeps Inst. 5440.2 for a Quality Control Division is desirable and workable when put into full effect.

►The inspectors should be assigned to the Quality Control Division under the Quality Control Officer and not to the shops.

►Inspectors should not be used for other than Quality Control except in an emergency.

►The number of inspectors must be kept to a minimum.

►The Quality Control Officer must have previous maintenance experience prior to being assigned.

►Provisions should be made to designate supernumerary inspectors. This alleviates problems arising from leave, special liberty or other absence of the regular inspector. However, the supernumerary is used only in the regular inspector's absence.

►Quality Control is a full time billet for the officer and personnel assigned.

NOTES AND COMMENTS ON MAINTENANCE

Misuse of Empty Containers

CLEANING fluid was given to the squadron in containers marked as containing anti-detonation fluid. Upon application of takeoff power both engines ran rough, and the flight aborted. The back-up aircraft also aborted for the same reason. It was found that Supply had been storing cleaning fluid in the drums without obliterating the old markings.

Recommendations were:

►that no methanol be accepted by the squadron until the seal on the drum has been inspected and found to be intact,

►that the squadron devise a test to determine that the contents of the drums are as stated,

►that when drums are to be re-used by supply, all old markings be obliterated,

►that personnel charged with the responsibility of issuing stock of this nature have a fair command of the English language.—*CFAW-6*

Oleo Servicing

ON local test flight of an A4D-2 following major inspection prior to takeoff, pilot got nose gear oleo kneel at 85 percent. Immediately after takeoff pilot attempted to retract landing gear. Both right and left main gear indicated up and locked, nose gear indicated barber pole. At approximately the same time the utility hydraulic warning light began to blink on and off at an approximate 4-5 second cycle. Pilot retarded the throttle to 90 percent, opened the speed brakes and lowered the landing gear handle. Gear lowered slowly and one at a time with the nose being especially slow to lock. Pilot burned down to gross landing weight of 12,500 lbs. and made as smooth a landing as possible.

Utilizing a newly acquired piece of equipment, air cylinder, portable, high pressure (by SPEN Co. of Brooklyn, N.Y.) the nose gear oleo was serviced with too much pressure by hydraulic shop personnel during a major inspection (1400 psi vice max. prescribed 250 psi). The compressor functioned correctly but was operated incorrectly. Upon retraction of the nose gear the oleo telescopic link assembly held intact. The nose gear could not compress due to overinflation; therefore the aircraft structure connected to the opposite end of the telescopic link assembly was pulled loose. Aircraft structure just aft of nose gear well and attached to nose oleo telescopic link was torn loose, and about 18 inches of skin pulled loose and the main structural member supporting the telescopic was broken.

This particular servicing error can cause a very serious situation because it is virtually impossible for a pilot to discover it during a preflight inspection.

It is recommended that more positive and exacting measures be taken by servicing personnel to assure proper oleo inflation and that an additional gage be used during inflation to insure that the prescribed pressure is not exceeded.

It is recommended that no new piece of equipment be utilized until proper and correct operational procedures have been taught to operating personnel.

It is further recommended that more stringent quality control inspections be utilized after aircraft inspections by the aircraft maintenance department.

The SPEN Portable High Pressure Servicing Units were received less than two days prior to this incident. Maintenance personnel were not familiar with this equipment nor had they received any instruction as on its proper operation. This servicing unit is handy to use, light in weight and not complicated to operate. However, it requires a thorough operational check-out to prevent exceeding prescribed pressures.

The following action has been taken to prevent similar maintenance mistakes in the future.

1. Large placards with prescribed servicing pressures for all applicable aircraft components have been placed in hangar, shop and line areas.
2. No new piece of equipment will be used by maintenance personnel until each man concerned has been instructed in its function, operation, and safety precautions.
3. Landing gear oleo pressures will be monitored during servicing by using a separate gage attached to the strut which will read direct strut pressure.
4. The recording of pressure observed during inflation will be placed on the check sheet and entry will be initialed by the maintenance man servicing the unit.
5. Only qualified hydraulics shop personnel will service oleo struts.

Birds Kaput—Slightly

For many years birds have been the bane of existence of airport operators, hangar employees and, more recently, airline pilots. Bird ingestion has been listed as a contributory cause to one fatal accident in which loss of power occurred on takeoff.

Recognizing this inherent danger to flight many airports are trying to discourage the presence of flocks of birds via noise of all types and tones. Other efforts are being made by various organizations to solve the problem through plantings not conducive to bird refuge.

Recently a petroleum company discovered a new principle that promises to relieve the bird situation. Small amounts of certain chemical are added to the bird's food. When this food is eaten it causes the birds to behave in an erratic manner and temporarily interferes with their ability to fly, although it does not render them unconscious. By their actions the affected birds warn others of danger and they leave the area.

In tests this method has been tried on gulls with amazing results. The gulls left the test site and did not return for a week. Further tests showed that only three or four affected birds are required to give the danger signal to a flock of over 1000.

Additional work is being done by this company to perfect both the chemical and the technique, but it does hold promise of eventually providing a control for birds in critical areas.—*Flight Safety Foundation, Inc.*

Safety in Fuel Tanks

INASMUCH as a tank explosion could be caused by an ignition source within a tank in any aircraft, Lockheed Aircraft Corporation has a suggestion to pass on to *Constellation* operators (and it might be well for other operators to note—Ed.). The suggestion is based on the fact that a tank will not explode, whatever the source of ignition may be, if the fuel vapors in the tank are too rich which is usually the case with gasoline. If only residual fuel is carried for several flights the "weathering" effect will progressively lean the mixture and the mixture will eventually reach the combustible range.

As a rule of thumb, it suggested that fuel in the amount of at least 2 percent of the total tank capacity (e.g., 20 gallons for 1000-gallon tank) be added to a tank if it has been empty or nearly empty during the preceding two or three flights. In other words, keep "freshening the fuel" in any tank, even though the quantity of fuel added amounts to only 2 percent of the tank capacity. This fuel can be used any time during the next two or three flights, or it may be retained, but in either case it is best to add fuel at intervals to achieve the desired result. If this procedure is followed and the fuel tank filler caps are properly installed, the chances of obtaining an explosive mixture in a tank will be minimized.

K-Pow!

AN experienced line division petty officer was instructed to check the operation of a bleeder air bottle. Air to the bottle was supplied from an air compressor which is used as a source of both high and low pressure air. Low pressure air only was to be used but in his haste to get the job done he did not check the outlet gage to see whether or not it was in the low pressure position or the high pressure position. Within seconds of applying the high pressure air to the metal bleeder air bottle, the bottle burst sending fragments of the bottle over 500′ with sufficient force to have injured someone or damaged something. Fortunately no one was injured and no damage incurred. The man operating the equipment was indeed lucky that he didn't kill himself.

Constant instruction by chief petty officers and division officers with regard to Safety practices is an ever necessary part of a man's life in the Navy. Short cuts are only death traps where *safety* is concerned. There is only one right way to do some jobs and that is why we have safety instructions, posters, and lectures. —*Anymouse*

Gasoline for Your Lighter

A serious fire was narrowly averted in an R4D-8 recently. The plane captain, as part of his preflight, was draining the rear tank sumps when a crewmember held an unlit cigaret lighter under the drain valve to fill it. The fuel immediately burst into flame. The drain valves were immediately closed and two 5-pound CO_2 extinguishers were discharged. The first was out within 30 seconds. There was no damage to the aircraft or injury to crewmembers.

Subsequent investigation disclosed that the static discharge line attached to the tailwheel was not in contact with the ground but was resting on three inches of snow.

It was concluded that the ignition was the result of a static discharge between the man holding the lighter and the aircraft.

Aircrewmen should be instructed to insure static discharge lines are grounded prior to any fueling operations. Furthermore, the practice of filling cigaret lighters from aircraft fuel systems is extremely dangerous and should not be permitted.

Deck Handling the Stoof Made Easier

DIRECTIONAL control of the *Stoof* during deck handling has presented a problem to a number of carriers. Without some sort of weight, the nose wheel of the S2F, WF comes off the deck particularly during travel to and from deck edge elevators.

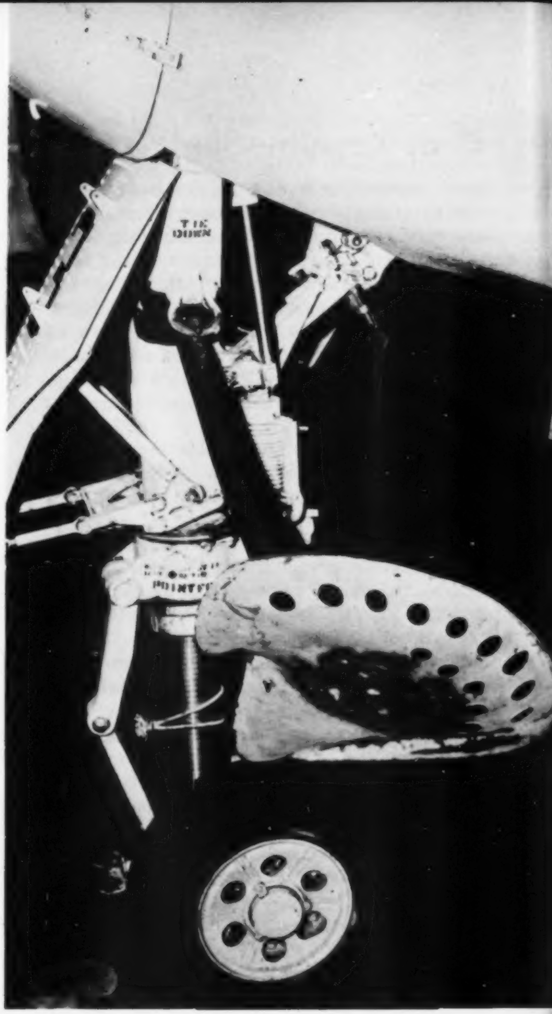
The problem was solved by Chief Aviation Boatswain's Mate W. C. Kimler while serving aboard the USS VALLEY FORGE. He designed out-rigger seats to weight the nosegear. These are attached by simply hooking onto the nosegear tie-down rings.

The *Stoof*, having no suitable pushing areas, was provided same through a pair of additional devices in the form of push bars designed to fit tail section tie-down rings. Up to six men can be accommodated, simplifying positive control so essential in confined areas. Sets of these devices are kept handy at each elevator.

Seats and push bars were manufactured aboard from materials available aboard.

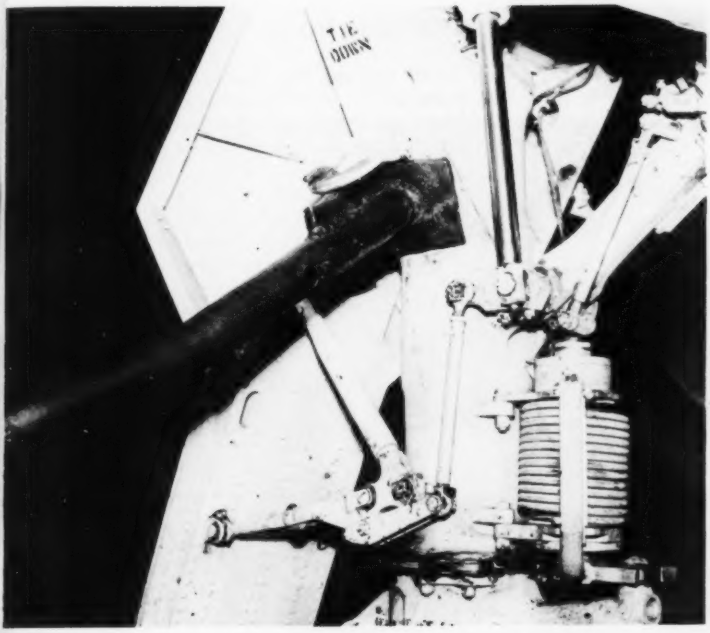
Proof of the success of this equipage is reflected in the record of the "Happy Valley" –No accidents due to this cause in two years.

This is one approach to the problem. What is yours?



Cantilever construction safely supports riders.

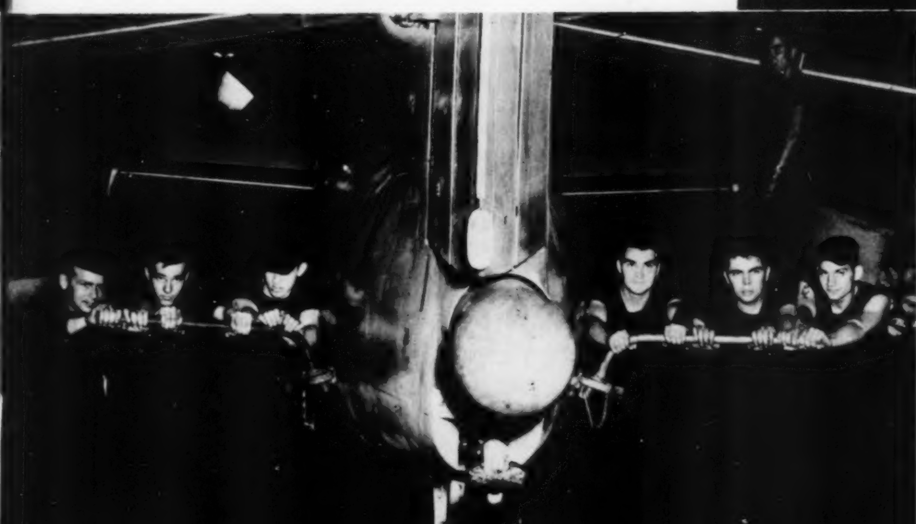
Plane handlers ride outriggers to weight nose-light *Stoof*.



Attaching hook and brace detail making for simple attachment.

Inventor Chief Kimler demonstrates pushbar.

Up to six plane handlers can be accommodated.



Fuel System Contamination

IN troubleshooting fuel system problems, activities have inspected the interior of fuel cells in attempting to isolate the source of malfunctions. Of particular significance has been the discovery of a fungus growth attached to the cells, especially in an area where residual fuel is not available to the engine. This so-called fungus is generally referred to as "green slime," being similar in appearance to the deposits found in stagnant water. Actually, this fungus is a form of bacteria which feeds on fuel, and it eventually results in fouling filters, screens and fuel quantity probes.

Without getting into a treatise on biology, it can be stated that the slime in question is produced by various forms of algae which live and multiply as a reaction factor between fuel and water in storage tanks. If not properly controlled, the growth of these organisms can become extensive. If all filtration, water separation and other fuel purity safeguards are not closely adhered to before the fuel is pumped into the airplane, the fuel cells and system components can become contaminated.

It appears then, in view of the current problem, that certain quality control measures might be instigated in accordance with the following:

►Each time a fuel cell is opened for inspection, . . . , the various filter elements in the system, the sump screen and the bottom of the fuel tank should be carefully checked for the fungus and corrosion. Slime residue should be removed by scrubbing the tank interior with an approved detergent and warm water, and then flushing with cold water to remove the cleaning solution.

►It is recommended that all fuel handling methods be reviewed with particular attention given to the regular examination of filters, water separators and storage tanks. It might be pointed out that the presence of water in storage tanks can originate from a number of sources such as water entering the tanks through leaking seals in floating roofs, leaks in the tank structure and as a result of condensation from the air space and from the fuel itself.

►Finally, if one is not familiar with the appearance of slime residue, it can be easily overlooked and wrongly assumed that any residue found is merely the deposit of debris, . . . , which often settles to the bottom of fuel cells. If the appearance of the residue therefore cannot be correctly determined, it would be advisable to have a sample checked in a laboratory for presence of fungus culture by a microscopic examination.—*NAA Service News*

Color Stability of AvGas

COLOR is an important quality control check for aviation gasolines. A change in color usually indicates:

(1) the wrong grade of fuel,
(2) contamination with another product, or
(3) loss in fuel quality.

Color change has appeared for another reason since the introduction of the hydrant system. Fuel trapped in dead ends or unused portions in the system has changed color without affecting any of the other properties of the product. The change in color is particularly true when the fuel contains more than one dye component. For example, aviation gasoline 115/145 is purple, a mixture of red and blue dyes. A chemical aviation gasoline 100/130 is green, a mixture of yellow and blue dyes. A chemical reaction can take place and weaken the lighter dye component of the fuel. When this occurs, the blue dye component is not affected and blue dominates the color as seen in visual checks.

There have been several instances where aviation gasoline 100/130 and 115/145 in hydrant systems appeared bluish, the color of aviation gasoline 91/98. The appearance of the fuel caused considerable concern and in one case the aircraft was defueled causing a delay. However, fuel of proper color appeared after flushing the hydrant system into a tank truck for a few minutes and the fueling was completed satisfactorily.

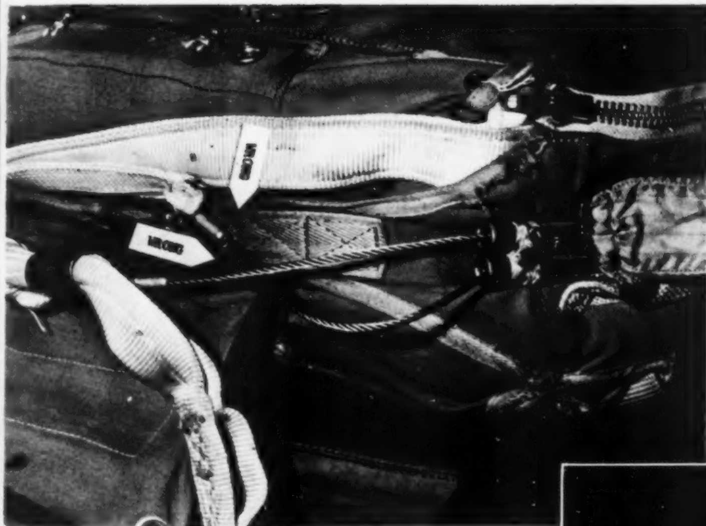
Therefore when a color change appears in a *hydrant system* operation the following steps are recommended:

1. Check the operating storage tank to be sure proper product is being delivered to the hydrant system. This will indicate if the color change was caused by the above mentioned process.
2. Flush sufficient product from the hydrant system to obtain fuel meeting the right color specification before delivering to an aircraft.
3. Return the "off color" fuel to a bulk storage tank. The volume of "off color" fuel will be small compared to that in the bulk storage tank and have no effect on the over-all color.
4. Establish a schedule to circulate product in the hydrant system on a monthly interval until sufficient experience indicates a longer time interval may be used.

NOTE: If there is any doubt regarding the fuel quality, fuel should be segregated and a complete laboratory inspection obtained.

Courtesy of ESSO Aviation Service Bul.

MURPHY'S LAW*



Martin Baker Murphy

MURPHY'S Law with its accompanying hazards continue in Naval Aviation. APPROACH affords wide dissemination of these occurrences in the interest of Aviation Safety.

Recently this squadron experienced Murphy's Law. An F9F-8T aircraft was transferred to this command from another squadron with the *slide disconnect cable* of the Martin Baker Ejection Unit attached to release pins of the main parachute, and the *main parachute rip cord* attached to the slide disconnect. The cable is identical in appearance; however, the slide disconnect cable is approximately 1¼ inches longer than the main parachute rip cord. Had a manual release from the seat become necessary the "Murphy" could have produced a fatality. *T. B. Wood, CO, VMAT-1*

* If an aircraft part can be installed incorrectly, someone will install it that way!

CLIPBOARD

Alcohol

ALCOHOLIC beverages are erroneously considered to be stimulants. The reverse is actually true: Alcohol is a powerful depressant and has an anesthetic effect. The effect of the depressing action on the brain is to quickly impair judgment and muscular control, even in small quantities.

Early in the course of intoxication the loss of discrimination may give the illusion of stimulation or exhilaration. The further course of bodily impairment, leading to unconsciousness, is common knowledge. The liver can oxidize about ⅓ of an ounce of alcohol per hour. This process continues until all of the alcohol is oxidized or eliminated from the body and many hours may be required, depending on the amount of alcohol consumed, for the body to recover completely.

It must be recognized that flying requires the most alert nervous control, muscular coordination and judgment. Pilots who are impaired by alcohol, even to the slightest degree, should be grounded until fully recovered.

—OpNavInst 3740.7, 25 June 57

SOP for Night Flying

►Avoid sending a pilot out who is inexperienced or lacks recent experience if recovery is expected with no horizon and an overcast.

►Avoid taking the eyes off the gages once a penetration starts, expecially to look at lights.

►Avoid staring at lights. If you have to look at them, make it a fast glance and glue your eyes back on the horizon bar.

►Avoid trying to fly the gages and contact at the same time.

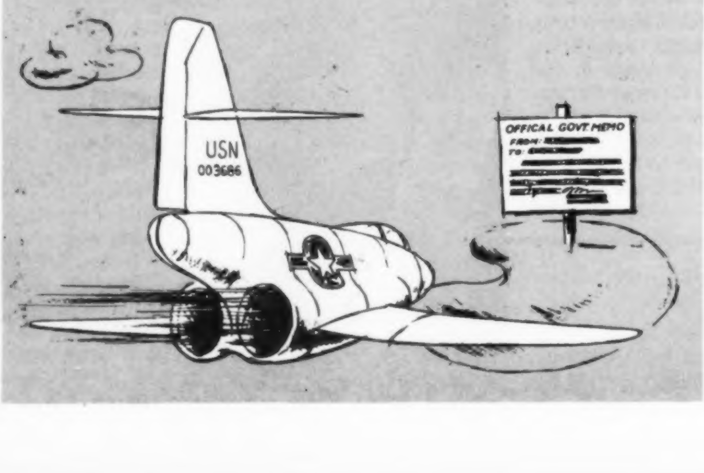
►Ignore the seat of your pants, believe your instruments.

►If you get that vertigo feeling, and have the time and fuel to get back above the overcast where you can regain your equilibrium, do so. The next approach is by a more experienced pilot.

►It can happen to you. All your night flights may have been with a horizon.

►*Beware of Lights* on black nights with no horizon.

—ComNavAirPac Safety Bul.



Safety Shadow

SAFETY casts its shadow over everything including the flight crew themselves, lettering on an airspeed indicator, landing approach minimums, coffee cup holders, flight watch reporting points, cockpit command terminology—to mention but a few of the almost endless items, big and little, which reflect on safety.—*TWA "Flite Facts"*

IFR Refresher Lectures

SQUADRONS returning from lengthy deployments will be offered three hours of lectures and discussion covering the flight publication system and all applicable recent revisions to OpNav and FAA instructions. These lectures are intended only as an aid to returning squadrons to reacquaint pilots with current FAA flight rules.—*ComFAirNorfolk Inst. 1520.1*

38s and Tracer Ammo

"There have been numerous instances where the 38 caliber tracer was the only means by which a pilot was rescued at night. Many commands have been reluctant to issue this important equipment on the premise that it involved too great an accounting load. This is a weak excuse for failure to provide personnel with the safeguards which are considered so important in saving lives."—*ComNavAirPac*

"The flight simulator is by far the most important device for combating habit errors."—*FSF Exchange Bul. 60-111*

WELL DONE!

To LT J. P. KASHETA, JR., MC, USNR, for rendering first aid and rescue services to a critically injured pilot under difficult conditions.

Riding the SAR helicopter to the site of the crash of a T-28C in a swampy, heavily wooded area, LT Kasheta spotted a moving person some 15 to 20 feet from the burning wreckage. With no place for the helicopter to land, he had the pilot hover over a small clearing near the crash and lower him by hoist. The survivor was conscious but suffering extensive and serious burns and fractures. Fire was spreading along the ground two feet away.

LT Kasheta put out the fire smoldering in the survivor's flight suit, released his leg straps, separated him from his parachute pack and carried him 50 yards to a smaller clearing. After returning to the crash site for his first aid kit, he administered morphine to the survivor and made sure he could breathe. LT Kasheta then ran to the clearing into which he had been lowered and motioned the hovering helicopter to lower the Stokes litter. He carried the survivor back and placed him in the litter.

To further complicate the rescue he found that portions of the litter attachments were missing. Using his key ring to secure an open shackle and making other adjustments, he improvised a jury rig and the injured pilot was hoisted aboard the helicopter.

The Chief of Naval Air Basic Training stated in his endorsement to the AAR, "LT Kasheta is to be commended for effecting a very difficult rescue under trying circumstances." To Flight Surgeon Kasheta for actions in the highest tradition of the medical profession and naval aviation, APPROACH extends a hearty well done . . .

* * *

Dr. Kasheta has been recommended for the Navy-Marine Corps medal—Ed.

"After The Event Even A Fool Is Wise."—*Homer*

OF COURSE, it is improbable that Homer was talking about accidents. In his day, you could stub your toe, get stepped on by a horse, or run over by a chariot; factories and their hazards, as we know them, were nonexistent. Today, when every man can sit in front of his television set and tell you what pitch the pitcher should have thrown to the guy who just knocked one out of the park, Homer's statement is particularly appropriate.

After an accident, you can easily find a half dozen fellows who could have told you the accident was going to happen; they had often seen the injured man perform the unsafe act. Since this is after the event, you might get the idea that I'm painting these fellows with Homer's brush, but such is not the case. It is not unlikely that they did observe the man perform the unsafe act on many occasions. Why should six fellows who knew what was going to happen, stand by and see the accident happen or one of their fellow workers injured? There is absolutely no excuse for such a thing—yet it happens.

What's the point? Just this—we must encourage every one to prevent accidents by helping others to recognize unsafe work habits.

Knowing that there is something we can do about it puts us in a position to be wise so that we can. Let's get going and eliminate the possibility of an untoward event.—*from NAS, Pensacola*